

Eleanor Rachel Dare
Goldsmiths, University of London
PhD Arts and Computational Technology

**Navigating Subjectivity: *South*, a psychometric
text adventure.**

I declare that the work presented in this thesis is my own:

Eleanor Rachel Dare

Abstract

South: A Psychometric Text Adventure is an artist's book and a set of software programs. The *South* project re-conceptualises the artist's book and wider book-forms, encouraging models of interaction that are aware of specific locations and individual subjects. These alternatives are a response to what this thesis frames as two rapidly stagnating forms. The thesis argues that both the artist's book and electronic literature (see the glossary on page 343 for definitions of the key terms used throughout this thesis) have not made a significant impact on the cultural landscape of the early 21st century. Nor have they made a significant use of the key technological changes that have occurred since the first electronic literature emerged in the late 1970s (in the form of interactive fictions, sometimes called 'Text Adventures', such as *Colossal Cave Adventure* (Crowther, 1976)).

In order to move forward from the increasingly problematic, disembodied, computational models used in these early digital works (discussed in chapters two, five and six) this thesis specifically recommends the formation of temporally specific, contextualised, relationships between readers and digital texts. The *South* project presents a multi-linear, situated and embodied form of intra-activity (see glossary) as an alternative to more linear forms of interaction. These ideas and their implications for electronic literature and artist's books will be clarified and outlined throughout this thesis, as will the rationale for framing them as valid models for moving electronic literature and artist's books into a position of cultural and technological relevance.

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Chapter I: Introduction



Figure I Above the *South* book and 'egg'. The egg is an interim object that connects the *South* software to the *South* book. The egg object is an LCD digital photo viewer, readers can click its backward and forwards buttons to access the bespoke content generated for them by the *South* software. When connected to a computer via USB users can load the images generated by the software into their egg (they can also be loaded into a mobile phone or laptop). Readers can then experience a unique set of instructions that guide them through both the South Bank location and the *South* book. Eggs can be purchased from this site:

<http://www.hardwareSphere.com/2008/06/09/egg-shaped-digital-photo-frame/>

South, a Psychometric Text Adventure is an artist's book and a set of software programs that re-conceptualise the artist's book form. The *South* project represents a significant overlap between the artist's book and literary works, hence the allusion to both forms throughout this thesis. In relation to both artistic and literary forms the project fosters a creative sensitivity to the temporally and socially entangled agencies that are always at play, but often subsumed, in complex systems of human-computer communication. *South* in both its analogue and digital book forms is designed to work with a physical location, the South Bank area of South London, but it is also designed to work with the subjectivity and 'personality traits' of individual readers, and with wider situating forces.

Figure 1a, Outline of the *South* system.

The *South* system:

1. The *South* software

Scrapes the web to get data. It analyses the data to try and understand contexts and situations. The software also asks readers questions to try and understand them. It then generates unique content in the form of image files. The image files contain instructions for readers.

2. The *South* 'egg'

Is an off-the-shelf device for displaying images. Readers can load up the egg with images generated by the software and take it with them to the South Bank. The egg is also a motif that runs throughout the *South* Book.

3. The *South* book

Is an analogue book that can be used with or without the software-generated content. The software-generated content provides unique pathways through both the book and the South Bank location. The book includes fictional stories about the avian scientist and spiritual guru Ivan Dâr.

The *South* software and book represent a practice-based hypothesis that subjectively and environmentally situated *intra-active* software can enliven electronic literature and artist's books while significantly developing previous notions of 'the interactive'. *Intra-activity* posits a situated and dynamic form of inter (or *intra*) action that unfolds between or rather *within* the moment of connection between a range of actors, or agents, both human and non-human. The software also presents the case for bespoke works while acknowledging and nurturing collective meanings and shared experiences, the book contains collective content generated by multiple readers but it also engages with readers as specific and situated individuals. Such an approach challenges linear, humanist conceptions of agency that might characterise the 'bespoke' as a solipsistic construction. The conclusion (beginning on page 296) to this thesis outlines a number of projects, peer reviewed (published) papers, installations and performances that have been made possible by my PhD practice and methodology, supporting the proposal that the *South* system – consisting of the analogue book, software and digital egg (or image viewer) are viable alternatives to previous models of digital interactivity.

The *South* project evolved in relation to the continuum of my practice as a writer and fine artist engaged with making artist's books. The project was also developed in the context of a critical examination of previous digital literary works. Throughout this thesis I propose that such works have not lead to the death of the book and that electronic literature has not met the hyped expectations proclaimed by some commentators in the late 1980s and 1990s. Similarly, within the fine arts the artist's book has, with a few exceptions, failed to engage significantly with computation. This thesis argues the case for these statements and for a material engagement with digital technology, and more specifically, for an engagement with interactive programming that extends the philosophical and critical involvement many artists have historically exercised in relation to the book form.

This thesis links the absence of significantly computational artist's books to the putative 'failure' of electronic literary works (again, acknowledging some important exceptions). The terms I use in referring to digital forms of text are fluid and subtle,

hence the need for a glossary and a degree of flexibility in referring to the *South* project, which encompasses aspects of broad terms such as *digital literature* and more specific terms such as *Interactive Fiction*, these terms are all defined in the glossary.

Within this thesis the lack of significant material or processual impact on literary and artist's books by computation is linked to a lack of critical engagement with both the philosophical meaning and material capacities of computers and 'interactivity'. The rationale for my approach is rooted in a critical evaluation of key historic and contemporary electronic literary works, for example, Talan Memmott's *From Lexia to Perplexia* (2000). This work is notable for its engagement with computation beyond, as Hayles puts it, reducing computers to a matter of 'hardware and software' (Hayles, 2000). However, there is little sense of this work, and of so many other such works, engaging with the significant paradigm shifts of recent (early 21st Century) computing. My research indicates that there are few examples of notable electronic literary works that successfully deploy the strengths of contemporary computation, such as its networked, locative nature and the ability of computers to learn from users. The genre of IF (or *interactive fiction*, see the glossary) is a form that epitomises the stagnation of electronic literature, with no significant material changes to its core computational processes since the earliest IF works of the late 1970s. This lack of material-technological evolution has a high degree of significance upon the works such systems produce. These works and the systems which they are written with appear oblivious to such key contemporary cognitive and computational concepts as embodiment, situatedness, enactivism, locative technology or real world interaction (see glossary).

This thesis proposes that many electronic literature systems (such as Eastgate Systems and TADS) and the works that result from them are stuck in problematic and anachronistic computational paradigms. Even fewer works draw upon the embodied and situated presence of human readers. I support this statement by also pointing to the 'showcase' of the 'Electronic Literature Organisation'¹ (or ELO, one of the most high-profile organisations for the promotion of electronic literary works.). There are few contemporary works on show within the ELO site that seem

¹The Electronic Literature Organisation available here: <http://www.eliterature.org/showcase-index> (Accessed 02/04/2011).

to have advanced beyond the computational paradigms of 1970s artificial intelligence (characterised by rigidly pre-determined rules and a disembodied framing of human intelligence). The most up-to-date works on show at the ELO site include Zuzana Husarova's *round@bout* (2011) and the prize-winning *Quadrego* by Stefan Maskiewicz (2001). These are both engaging works, but offer little in terms of significant technological innovation as outlined above. Indeed, it is significant that the ELO site does not have many new works, reflecting, I would argue, a genre that peaked in the late 1990s. Similarly the genre of Interactive Fiction has very few contemporary works on offer. The Wikipedia entry for Interactive Fiction² has no works listed in its 'notable works' section that are newer than eight years old, pointing to a form of electronic literature that is rapidly losing cultural and technological relevance.

Eastgate Systems, which advertises itself as 'the primary source for serious hypertext' and which also still produces anachronistic technology for generating hypertext fiction³ has a webpage that is filled with works from the 1990s. The works it lists on its front page include *Afternoon a Story* (Joyce, 1987, 1990), *Patchwork Girl* (Jackson, 1995) and *Victory Garden* (Moulthrop, 1992). I cannot find any significant contemporary works listed on this site.

It is also significant that a proselytiser of electronic literature such as Nick Montfort (2003) acknowledges it as a form that has not gained a wide-spread readership. Even computer literate people, Montfort states, are resistant to the 'idea of computer literature' (Montfort, 2003: 232), I would also point to the lack of prominent works of electronic literature (Montfort uses the term 'computer literature' in the same sense that I refer to 'electronic literature', see glossary), and argue that it has failed to reach the consciousness of readers in the same way that analogue literature has. *What and where are the great works of electronic literature that might refute my argument for its failure to reach readers in the same way that analogue books have? What are the names of these works and who has read them?*

²Available at http://en.wikipedia.org/wiki/Interactive_fiction accessed 10/04/2011.

³ Available at <http://www.eastgate.com/catalog/Fiction.html>, accessed 10/04/2011.

While games and blogs are reaching mass audiences, it is still unclear that the ELO definition of Electronic literature (which encompasses interactive fiction, computer literature, and digital fiction) can in any way be described as having a significant cultural presence. If it were a significant cultural force, then, one might argue, the names of important works would readily spring to mind. But the reality is that the few electronic literary works that do spring to mind were written in the 1990s (such as Jackson's *Patchwork Girl* (1995) and Moulthrop's *Victory Garden* (1992), and even then, these works have arguably made a small impact on the larger literary landscape. While e-books, particularly in Kindle format, are increasingly prevalent (In 2010 Amazon sold more Kindle editions of books than hard-cover books⁴), I would make the point that these works do not represent a significant difference in kind from analogue books – rather they are re-mediated versions of traditional book-forms. E-books in Kindle format do not deploy any of the significant computational structures and processes I discuss throughout this thesis⁵.

This thesis argues the case for a more nuanced understanding of human-computer relationships, one that accommodates new understandings of HCI but does not presuppose a discontinuity in the conceptual foundations of programming and computers from other cultural and philosophical artefacts. My thesis frames computational constructions within a historical continuum, in which both the subject and the subject's generation of knowledge are linked to enlightenment and positivist philosophical positions, and therefore to wider cultural and historical movements. At the same time I have sought to confront or re-frame the separation between computers and humans, or indeed the ready made separations that we project between subjects and objects (including readers and books). An important aspect of

⁴ See *Wired*, July 2010, available at <http://www.wired.com/epicenter/2010/07/amazon-more-e-books-than-hardcovers/#> accessed 08/04/11.

⁵ E-books do not learn from readers, transform the text in response to them or understand the situations and feelings of readers, but this is not to suppose that this will always be the case, Kindle-readers have the potential to use computation in far more challenging ways, for example by dint of their ability to be networked via web access and the potential for dynamic, locative, content.

my work has been to identify significant features of computational knowledge generation, while acknowledging that computers are not clearly separable from ourselves, but, like all human artefacts, are *of us*. This methodological position is supported by writers such as Donna Haraway (1991), Henri Bergson (1896, 1907), Rosi Braidotti (2006), Karen Barad (2007) and Lucy Suchman (1987, 2005, 2006). These writers shore up the proposition that human beings are entangled with their technologies and with complex, relational and temporally bound systems of agency.

Throughout the three years of my PhD practice I have also written an online research journal entitled *Automatic Writing*. The journal documents and reflects upon my practices and processes and has had a significant impact upon my methodology and thesis. This is reflected in my commitment to a subjectively articulated practice, particularly in regard to programming. Such a practice acknowledges the presence of a non-neutral programming practitioner, one who is embodied, gendered and culturally situated. The research journal therefore supports my core methodological position in regards to a subjectively and environmentally situated practice. Chapter three contains more information about the significance of the research journal.

My research journal is available here: <http://www.dareinteractive.com/blog2.html>.

The *South* software can be downloaded from this address:

http://www.doc.gold.ac.uk/~ma501ed/south/south_Download.html

The full, commented, code and Java documentation for the *South* software is also available at the above address.

The *South* book can be downloaded as an e-book or purchased as a paper-back from this address:

<http://stores.lulu.com/ma501ed>

The development and testing of the code is described in the appendices to this thesis, beginning on page 318. Also submitted with this thesis is a DVD that contains the *South* software, this thesis in electronic format, the *South* book and a film about the project.

1.1 Purpose of the research

This research was conducted in order to support the generation of significant new forms of digital and artist's books. It was funded by a full studentship from the Engineering and Physical Sciences Research Council. The research critically evaluates and examines the status and role of electronic literature, artist's books and the broader area of digital interactivity. My research explores the extent to which *a priori* structures should define computational literary works and wider conceptions of the interactive. Both the benefits and the drawbacks of using the subjectivity and situatedness of individual readers are also investigated. Likewise the expectations and opinions of potential readers in relation to interactive works were also solicited and constructively embedded within the research design. The research specifically highlights the importance of engaging with the cultural and philosophical significance of programming practices. Such an engagement enables us to recognise significant differences of kind between computational and analogue forms as well as meaningful differences in degree. This recognition can help us to focus on the strengths computation has to offer as well as protecting practitioners and theorists from making exaggerated claims for digital works. The results of this research are likely to benefit both the producers of interactive works and their users. This claim is supported by a number of new projects and collaborations I am involved in. These individual projects and collaborations deploy the methodological and technical strengths generated by this project, encompassing diverse areas from presenting academic papers, to film-making, site specific performance, online curation⁶, website design, teaching and collaborative fiction writing.

Research questions and goals Although my questions have evolved and changed throughout the three years of this research, the main questions I have addressed are essentially those listed below, my primary question is:

⁶ The online curating project, with Lee Weinberg, involves a customisable and personalised art viewing experience, see the conclusion for more information about this project or visit the VAINS site here: http://www.wix.com/Vains_Pro/VAINS

- How can subjectivity be reconfigured within software that generates dynamic, intra-active, artist's books?

The research has also addressed the following sub questions:

- Can the artist's book be meaningfully re-mediated within a computational framework?
- Can computers understand their readers and generate worthwhile insights into them?
- To what extent must computer programs depend upon *a priori* rules and how rigid do those rules need to be?
- Is it possible to create a computational artist's book that reacts to people dynamically and in an interesting way?

These questions were then focused into the following core aims or research goals:

- Create dynamic relationships between humans and books.
- Produce a digital and analogue book that tries to understand human subjects, even if that understanding is flawed by asymmetries of comprehension between computers and humans.
- Make the software and book as reflexive, situated and transparent as possible.

As a result of these questions and their attendant aims I assert, as explained below, that the research was justified and has resulted in an original and significant contribution to the field of artist's books and interactive literature.

Justification for research and contribution

The thesis presents the case for works that are subjectively and environmentally situated, arguing that *intra-active*, as opposed to *interactive* works can enliven electronic literature and artist's books, making a significant contribution to furthering computational arts. The research has highlighted reasons for the failure of interactive

digital literary works to make a significant impact upon our relationship to books. This thesis links these causes to wider problems within the domain of Artificial Intelligence and computing. Specifically this research and thesis contributes an alternative accommodation and conception of agency within computer-human-interactions. This conception of agency acknowledges (and indeed deploys) the deeply entangled nature of subject-object and human-computer relations, framing them as productive tensions, paradoxes and performances within a complex network of evolving actions and meanings. This thesis supports the proposal that the *South* project is a viable and original form of subjectively and environmentally situated artist's book and literary experience.

1.2 Detailed thesis outline

Chapter 2: The literature review

The literature review represents a critical appraisal of my research context and materials. The review was formed in light of my thesis questions and by means of a disciplined strategy aimed at clarifying the core themes and frames of reference that relate to those questions. The review analyses and evaluates core source materials, assessing and comparing claims, and gathering evidence to generate and support my

own arguments and strategies. The review is organised thematically. These themes mirror many of the central concerns of my main chapters and are in brief:

- Subjectivity, embodiment, interactivity, and situated knowledge.
- Artist's books, readers and writers, hypertext theories, digital literature. Site specificity and pervasive games.
- *Chatbots*, Agents and agency and agent-based literary works.
- Technical review: computational narrative systems, personality testing.

My aim has been to investigate the relevant historical and chronological developments of theories and practices for each area, summarising the contribution of each work referenced. The literature review highlights the tensions and connections between the works and ideas cited, clarifying their relationship to my own practice. This approach has enabled me to assess the validity of generalisations made about my core subjects and to compare the positions taken by a range of relevant theorists and practitioners. I have also identified areas in which there is very little documentation, such as the subject of computationally engaged artist's books. The paucity of relevant works and writings about artist's books and computation has led me to seek information from unorthodox sources, such as online forums and Twitter sites. These alternative resources enabled me to both join and instigate debates on book artists and digital media. The lack of formal documentation in this area has been a noteworthy discovery in its own right, indicative of the lack of significant engagement between book artists and computation.

The review offers appropriate and credible evidence for my methodology, while avoiding simplistic generalisations. This evidence supports a consistent and logically coherent argument for my research practices and their outcomes, and for the conception of a situated and intra-active artist's book.

Chapter 3: Methodology

Chapter three explains and situates my methodology. It describes my approach to undertaking research, in particular, how and why my methodology has been embedded with a commitment to highlighting partiality of perspective. Liz Stanley uses the term 'alienated knowledge' (Stanley, 1990: 3) to describe a form of knowledge production that is not critically engaged with its own social and historical conditions of production. Through the use of my *Kavad* (a conceptual tool for defining and refining my methodology), or mobile methodology box, I explain my own relationship to such a subjective self-articulation, highlighting its impact upon and through my practice. This chapter also draws upon the writings of Sullivan (2005), Bolt (2006) and Carter (2004). These writers address issues of reflexivity,

epistemology and the relationship between arts practice and theory. I show how and why my own methodology has evolved and mention art works and practices that have been influential such as Dunne, Gaver and Pacenti's (1999) *Cultural Probes* and other key examples of practice based research methodologies from analogue, digital and hybrid disciplines. The chapter explores the implications of what Paul Carter (2004) has called *material-thinking* and the generation of knowledge through practice, which Barbara Bolt describes as 'a particular understanding that is realised through our dealings with the tools and materials of production'⁷ (Bolt, 2006). I will explore how and why this still represents a radical form of knowledge production within the wider context of the Western academy. I also outline the ethical challenges I have faced in undertaking my PhD practice.

Chapter 4: The South book

Chapter four grounds this thesis in the actual processes and artefacts engendered by my practice. The chapter looks in detail at the construction and content of the *South* book. It explains how the book relates to the other elements of the *South* project while elucidating its theoretical and cultural contexts. The chapter also cites relevant examples of other artists who work with the book form, explaining the historical provenance of such books. The chapter reflexively contextualises the rationale for the *South* book, exploring the relationship between my practice and my own historical and cultural background. I reflect upon the wider social forces that have played subtle yet profound roles in my own family history, defining and constricting, for example, the languages spoken by two of my grandparents. The chapter concludes with an illustrated case study in which a reader engages with the *South* book and egg. The case study shows how the reader interacts with the project, following her as she explores the South Bank area of South London.

Chapter 5: Subjectivity, interactivity and embodiment

⁷ Bolt, B. (2006) *Materializing pedagogies. Working Papers in Art and Design 4*
Retrieved <03/01/09> from URL
<http://www.herts.ac.uk/artdes/research/papers/wpades/vol4/bbfull.html>

South is a book and a computational system that appears to ‘know’ the individual readers who engage with it, but how can a book or a software system acquire any understanding of complex individuals? What are the problems inherent in this quest? This chapter will show how the *South* system has dealt practically and theoretically with notions of the subject and the subject’s interaction with a computational system for generating personalised narrative experiences.

Subjectivity and interactivity are the two key areas that inform my research and practice. The theoretical discourses around subjectivity that I have researched identify many problematic aspects in relation to the very notion of a subject, subjectivity and the supposedly diametrical construction, objectivity. This chapter outlines these critiques and shows how they relate to my practice. It shows how the notion of a unitary, rational and essentially disembodied subject has informed many of the assumptions embedded in software structures and notions of interactivity. This chapter explains and contextualises alternative ideas such as those proposed by Elizabeth Grosz (1994), in relation to embodiment, and also Donna Haraway (1991), Lucy Suchman (1987, 2005, 2006) and Karen Barad (2007) in relation to ideas about *intra-activity* and expanded notions of agency. I show how these ideas relate to the design of the *South* software, particularly in connection to its use of psychometric testing and situating data.

Chapter 6: Chatbots, agents and agency

Chapter six elaborates upon the historical and intellectual context for digital systems based on agent technology. The chapter goes into some detail about intelligent agents and *chatbots* (software agents that engage in ‘conversations’) explaining how and why the *South* system critically differs from many previous works and in what ways my goals might be different from those of earlier projects. The chapter also asks what the designers of agent architectures such as Luck, Ashri, d’Inverno (2004) and Woolridge (2002) mean when they describe their agents as embodied and

situated. Do they refer to the same epistemological frameworks described by Donna Haraway (1991), Lucy Suchman (1986, 2005, and 2006) and Elizabeth Grosz (1994)?

With these questions in mind chapter six discusses how I have produced a system that incorporates alternative notions of embodied and situated knowledge. The chapter explains why I am committed to constructing such a system, expanding upon my theoretical, practical and ethical reasons for that commitment. I explain in detail the problematic issues connected to agent architectures, identified, for example, by Phoebe Sengers and Michael Mateas (2003). The chapter concludes that a contingent, culturally situated and loosely rule-based system is a more apposite model for embedding subjectivity into my own agent architectures. The chapter goes into some detail about the creative aspects of programming my own agent-based software, detailing the sometimes provocative functions of the agents embedded within the *South* system.

Chapter 7: Conclusion

This short chapter summarises my results and their implications. It also explores wider applications for a subjectively articulated and situated software model. The conclusion includes a discussion of ways in which my core findings and practices can be applied to other areas, including teaching methodologies, film-making, fiction writing, digital curating and the generation of heuristics for a wide range of research processes. The thesis conclusion summarises how I have dealt with the research questions outlined in this introduction while also acknowledging the inevitable gaps and contradictions embedded in aspects of the knowledge I have generated. Chapter seven synthesises the key terms and concepts represented in this thesis, articulating the re-conceptualisations that the thesis proposes and framing them as significant contributions to the field of both electronic literature, arts computing, and HCI (Human-Computer-Interaction). The conclusion summarises a number of papers I have written and presented about the *South* project and its associated collaborations, including papers presented in London, Copenhagen, Berlin and Stockholm. These papers support the claim that my PhD practice has generated viable solutions, and

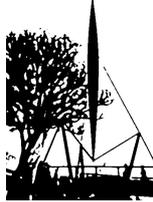
valid methodologies, and that these have been acknowledged within a broad community of practitioners and researchers.

Appendix

This appendix contains information and results relating to the evaluation and usability surveys that were undertaken between 2009 and 2010. The appendix also describes other tests that the *South* software was subjected to, such as acceptance, regression and recovery testing, as well information about obtaining and installing the programs, and the software development methodology that was deployed in their making. The appendix briefly introduces the three core classes of the *South* system which are fully documented on the *South* site. The *South* site also provides the full code, ready for download and installation:

http://www.doc.gold.ac.uk/~ma501ed/south/south_Download.html

At the end of the appendix there is a glossary that explains the key terms used throughout this thesis, such as *electronic literature*, *intra-activity*, *agency*, *situatedness*, and *performativity*, see page 343.



Every good book needs a protagonist and luckily you've come along just in time to fulfil that role. According to *How to Write a Blockbuster* 'characters provide readers with the emotional key, the route into your story'. This principle seems equally applicable to any decent guidebook or gazetteer, but the authors of this book also warn: 'if your characters are flat and lifeless, no one will want to read it'.

Are you feeling flat and lifeless? You're in for a pretty boring read if you are. Your job is 'come alive' so that I can just sit back and type. You should expertly discover who you 'really' are and help the rest of us to get to know you. You might of course be shy or introverted and reveal yourself just a little bit at a time, facet by facet as it were, or you might, on the other hand, just burst into life like a New Years Eve firework display over the South Bank. It's up to you.

Figure 2a the opening page from *South, a Psychometric Text Adventure*.



Figure 2 The *South* book and egg, which displays image files generated by the *South* software.

Chapter 2: Literature Review

My PhD practice is concerned with generating subject and site specific writing and experiences relating to the South Bank area of South London. This writing is generated by my software and an artist's book, which I refer to collectively as 'the *South* system'. The software guides readers through the analogue book and the South Bank location. The writing the *South* system generates is both fictional and factual; it is disseminated in the form of an analogue book and also through computational content generated in reaction to individual subjects and to specific moments in time.

This chapter will establish the contextual framework for the practice outlined above and for the theoretical background to my research. It will pinpoint relevant contemporary and past projects and investigate research into subjectivity, artist's books and computationally generated literature. The area of computational literature is intricate and entangled, drawing on a particularly broad range of interdisciplinary references and practices. This chapter is necessarily selective across this domain. I have selected research projects and theorists whose work is of direct relevance to my own practice. This practice is significantly concerned with situatedness and

subjectivity and with theories and projects relating to agency. Throughout this review I have focused upon projects and references that are relevant to my own practice while articulating a comprehensive degree of background coverage.

The structure of this chapter:

- **Section 1:** Subjectivity, embodiment, interactivity, and situated knowledge.
- **Section 2:** Digital fiction systems and agent based works.
- **Section 3:** Readers and writers, hypertext theories, site-specific art works, pervasive games and artist's books.
- **Section 4:** Technical review. This section focuses upon computational narrative systems and personality testing.

The themed sections in this review will focus on the concerns of my core chapters (four, five and six). Section four of this chapter consists of a technical review. These sections all delineate the issues that my work addresses; they establish the key projects, frames of reference, vocabularies, conflicts and agreements (where they exist) that are significant to each area. This approach will make it clear how my work fits into the larger context of digital literary systems and interactive programs, as well as to issues of subjectivity, epistemology and agency. Questions of agency arise in relation to the readers engaging with my work and in relation to my own presence and to the wider agencies operating upon the systems I create. The issue of subjectivity is embedded in the notion of a system that relates specifically to the individuals who engage with it. My practice asks what we mean when we refer to a *subject* or work with the notion of subjectivity, and how technology can articulate and accommodate more challenging notions of the subject. My practice aims to operate critically with forms of knowledge production and agency, positioning computational technologies as sites of practitioner-based investigation while articulating a meaningful and productive interplay between practice and theory.

2.1: Subjectivity, embodiment, interactivity, and situated knowledge

The central goal of my PhD practice has been to produce a new type of analogue and digital artist's book, one that attempts to understand and respond to individual subjects in a specific and situated moment in time. The following review aims to establish a theoretical framework for my research into producing this book. This section of the review investigates the historical development of subjectivity and agency while also connecting them to recent re-conceptualisations of the *interactive*. This section will also clarify the salient terms and definitions arising from theories of subjectivity. The writings covered by this review represent a coherent critical challenge to Western orthodoxies around individuality, individualism and the nature of our knowledge about, and as, individuals. These writings establish the historical grounds for their critique of past and present ideas around subjectivity. The material also suggests new methodologies and practices that emanate from re-theorising subjectivity and the nature and extent of our knowledge about our selves and other people. More radically perhaps, they present coherent challenges to orthodox notions of subject-object boundaries.

To clarify these issues this part of the review is divided in two. The first part will establish what a 'subject' has meant historically. It will ask how these notions have emerged and why they have been criticised. The second part of the review will discuss alternative methodologies for producing subjectivity, how they relate to my research questions and to notions of agency and interactivity and their further implications for my research.

Part I: Who is a subject and what is the problem?

In order to examine the philosophical and critical origins of subjectivity this review will look in detail at Henriques, Hollway, Urwin, Venn and Walkerdine (1984) and also at the contextual definitions presented in Alcoff and Potter, (1993). *Feminist Epistemologies*, approaches subjectivity as concomitant to its central theme of epistemology or the way in which knowledge is produced. The book is concerned with asking who is engaged in knowing, and uncovering the social origins of that 'knower'.

Despite their differing approaches it would be fair to say that both books formally trace the problematic origins of subjectivity back to the early seventeenth century, to the emergent idea of the individual as a pre-given, innately rational 'knower'. This knower is frequently referred to in *Changing the Subject* (Henriques et al, 1984: 93, 128, 133, 275) as the 'Cogito'. Although Descartes is not the originator of the rigidly empirical, positivist outlook that emerged from this period, (and is a more complex figure than this description implies), he is certainly framed as a central force in the emergence of a rationalist, unitary and essentially solipsistic paradigm for knowledge production. *Changing the Subject* deals with this paradigm at great length, exploring the philosophical and logical difficulty of the pre-given knower, whose innately rational interpretation of the world necessitates an infinite regress of internal knowers. In this model each knower acts as an agent of rational knowing, paradoxically explaining the knowledge they are supposed to embody by referring to a regress of internal knowers or homunculi⁸. Such homunculi are tiny fully formed people (or men) who can observe and rationalise but must each in turn logically contain their own internal knower or homunculus. This figure establishes an unbridgeable gap between himself and the external world, a regress of infinite mind-body dualisms, and, as the book so vigorously emphasises, a society-individual dualism that has enshrined 'psychology's individualistic concept of the subject' (11). Such a disembodied and abstract form of knowing is characterised by Elizabeth Grosz as the historical privileging of the 'purely conceptual over the corporeal'

⁸ See Ryle, Gilbert, (1984) [1949]. *The Concept of Mind*. University of Chicago Press.

⁹(Alcoff, Potter, 1993: 187). In her paper 'Bodies and Knowledge: Feminism and the Crisis of Reason', the root of the crisis is characterised as both the individualism of traditional Western epistemology and the disembodiment of the knowledge produced by that individual. It is a crisis that appears to revert back to the homunculus problem, to 'reason's inability to come outside of itself, to enclose and know itself from the outside: 'the inadequation of the subject and its other' (189).

Grosz also identifies the paradox of applying 'scientific' approaches to the study of subjectivity; approaches that negate the specificity of the subject. Perhaps more radically than any other writer referred to in this review, Grosz does not seek to ameliorate the crisis, which she would characterise as a crisis of masculine reason. Grosz suggests that the crisis¹⁰ is an opportunity to reformulate our understanding of what knowledge is and who produces it. It is an opportunity to integrate the body into new epistemologies and methodological approaches. As Grosz states in the introduction to *Volatile Bodies* (1994), the crisis represents an opportunity to 'displace the centrality of the mind, the psyche, interior or consciousness (and even the unconscious) in conceptions of the subject through a reconfiguration of the body' (v ii). The dualism of mind and body is symptomatic of other binary terms and oppositional pairings, both *Feminist Epistemologies* and *Changing the Subject* recognise the centrality of problematic dualisms in traditional epistemic schemas.

⁹ Mind-body dualisms are generally identified by the authors of these two books as being linked to the enlightenment. However In *Volatile Bodies* (1994) Elizabeth Grosz writes of *somatophobia* being present in pre-Platonic writings. Here the 'body has been regarded as a source of interference in, and a danger to, the operations of reason' (Grosz, 1994: 5).

¹⁰ The so-called *crisis of reason* (identified in particular by Jean-François Lyotard (1979)) has been a necessary outcome of recognising the situated, contextual and *specific* nature of knowledge generated in particular by late twentieth century theories around gender and race, or 'identity politics'. The crisis is linked to the demise (at least in the West) of our faith in 'grand' or universal 'narratives', such as *Marxism freeing the proletariat*. Elizabeth Grosz describes the crisis of reason as 'a consequence of the historical privileging of the purely conceptual or mental over the corporeal' (Alcoff , Potter, 1993: 187)



Figure 3 Above, subject specific content generated by the *South* software and by a *South* reader. When users interact with the software they create icons that represent themselves. The above icon represents the despair and exhaustion of a user called Anna. The software overlays Anna's icon with words she used earlier in her interaction with the software.

Society-individual dualisms

Section one of *Changing the Subject* illustrates the means by which developmental psychology has adopted and reinforced an epistemological and existential schism between the knower and society, framing them as antithetical entities. One example of this process is the way in which a child might be characterised as being socialised or conditioned by its *social context*. The individual is constructed as 'existing within a symbolic state of opposition to society', establishing a biological-social dualism between 'a biological organism with biological propensities and organization who becomes social through his encounters with social adults' (Henriques et al, 1984: 14). In this way even supposedly 'radical' humanist accounts of subjectivity reinforce a dualist scenario, in which the individual is cast as a 'passive recipient of moulding forces: either reinforcement schedules or adult socialisers' (19).

Other theorists such as H. Weinrich (1978) have proposed information processing paradigms, in which the external world is processed as data, a notion that echoes computational models of mind that have been the subject of theoretical criticism from, among others, Hayles (Hayles, 1999) and Haraway (Haraway, 1991), not least

of all for their reinforcement of mind-body dualisms. *Changing the Subject* highlights the external-internal dualism of the information processing paradigm and also, its recurring theme, the construction of a split between the individual and society. The book emphasises the relationality and complex interplay of biological and social factors, seeking to denaturalise views of reality that have reinforced either/or determinants.

My practice aims to establish an inquiry into the tensions between collective epistemological frameworks that allow for contextual notions of subjectivity, and the inherent difficulty of establishing universal systems of meaning. It is a tension I have also observed in the context of other computational artworks, for example Hugo Liu's and Pattie Maes's *Aesthetiscope* (2005) which is described as a system for 'visualizing aesthetic readings of text in color space' (2005). An interesting aspect of the *Aesthetiscope* project was the recognition of its own cultural specificities (the project draws upon the Jungian concept of *Modes of Interpretation*, implementing an aesthetic reading that moves away from a purely objective interpretation of colour, allowing individuals to attribute meanings to colours) and the centrality it placed upon emotional meanings, though unlike my own project, it did not overtly or consciously locate the specificity of its models and embedded structures. Neither did the *Aesthetiscope* project concern itself with unconscious or supposedly accidental 'errors' of cognition (discussed below). The *Aesthetiscope* project was designed to eschew 'singular objective meanings implied by text' (Liu, Maes, 2005: 1), and to encompass collective, 'culturised' meanings that might also be personal and emotional, in other words to generate a form of both specific and collective subjectivity. This was achieved visually by generating grids of colours in collective reaction to poetic texts. The project was computationally underpinned by Liu and Singh's 'commonsense reasoning system' (2004), the name of this system suffices, perhaps, to pinpoint the rational, positivist framework that informs the project and the constitutional difficulty of using one particular form of logical reasoning alone to construct subjective epistemologies.

The *Aesthetiscope* project has some key themes in common with my own work, such as the construction of a computational framework for subjective interpretation,

including what Liu and Maes describe as 'affective', communal and contextual meanings. The project is a useful case study in the context of my own research, both for its laudable ambitions and for what I am interpreting as its (perhaps inevitable) failures. As mentioned above, unlike the *Aesthetiscope* project, my own work is also interested in accidental meanings and misunderstandings.

In *Social Psychology and the Politics of Racism* (Henriques et al, 1984) Julian Henriques discusses the significance of 'errors of cognition' that are suppressed or discounted in traditional epistemic frameworks. Henriques cites George Kelly, originator of the *repertory grid system*, a psychological assessment methodology that I have been using in my own software and written texts to obtain subjective 'profiles' (the methodology is discussed at length in chapter five of this thesis). Kelly's *Personal Construct Theory* (1955) overtly characterises individuals as 'capable of making and testing hypotheses – a model which is based on an exclusively rational idea of 'man the scientist'. In many ways this is (at least at first glance) a socially inclusive, democratic methodology, but it takes no account, writes Henriques, 'of the 'experimenter effect'', nor does psychological practice to any great extent (according to Henriques) acknowledge the irrational aspects of human psychology outlined by Freud (among others). In fact, Henriques claims the non-rational subject is 'denied altogether in its own accounts' (Henriques et al, 1984: 80). Section two of this review will look at Lorraine Code's ideas for an alternative form of knowledge production. This alternative epistemology claims to avoid both the rationalist context-free assumptions of propositional knowledge production and the abandonment of all realist epistemic commitment represented by relativism. Like Code, the authors of *Changing the Subject* also identify the problematic assumptions underlying radical humanism. Radical humanism ultimately falls back on the originary notion of a pre-given, rational subject that stems from the very tradition they oppose (represented for example by John Shotter (1989)) and, on the other hand the positivist excision of emotion and context from idealised epistemic processes. Wendy Hollway expands upon the theme of the non-rational, non-unitary individual.

Such an individual is complex and contradictory and represents a critique of Foucauldian genealogies, which Hollway interprets as framing subjectivities 'as merely the sum total of positions occupied in discourses by a person' (231). Hollway also criticises socio-biological accounts of sex differences, which produce rigid and unchangeable accounts of gender. Hollway asks why some people choose to take up certain positions over others, even if those positions might be viewed as restrictive or oppressive. Hollway concurs with her fellow writers in *Changing the Subject* by challenging the notion of 'choice', which implies a rational, voluntarist motivation. Instead she returns to the Freudian term 'investment', a term that accommodates the complexity and contradiction informing our choices, which may be unconsciously motivated. The choices we make, Hollway suggests, are neither wholly biological, Oedipal, socially or economically determined (239). Instead she argues for fluidity and complexity, the recognition that our choices are often formed by competing discourses, bearing both socially constituted and suppressed meanings.

Psychometric testing of 'personality'

The *South* system (consisting of a book and a set of computer programs) asks readers to engage with a series of psychometric testing methodologies. These methodologies are designed to aid the computer in generating subject-specific writings, but they are also designed to generate a form of investigation into subjectivity that is grounded in material practices. These practices are generated through actions and physical sensations. My work therefore is highly engaged with issues of psychological evaluation and its relationship to subjectivity.

Wendy Hollway (1984) expands upon the theme of what constitutes a subject in her paper, 'Fitting Work: Psychological Assessment in Organizations'. Hollway approaches the topic of psychometric testing as a 'technology of the social'; a Foucauldian approach that establishes the 'relations between power and knowledge' (26). The concept of psychological testing, Hollway suggests, is predicated on the belief that its methods are scientific and therefore what they produce are related to

'the truth'. It assumes that there are such things as individuals and that it is 'just a matter of developing methods to assess them' (27), but this testing, Hollway reports, is based on a dualism between society and individuals that enables the 'science' of psychometric testing to function but also weakens its insights:

one effect of that power of psychology is to privilege the individual as the focus of activities which are in fact specific characteristics of corporate organisations.

(56).

Psychometric testing in an occupational context has been used to 'evaluate, predict and regulate employees' (56). Psychologists who use these assessment methodologies do not theorise themselves or the organisations they might be working for. 'Social and power relations are left out in this approach' (57), maintaining what Hollway defines as an illusion of neutrality. 'To deny the power of hierarchy, or of the technologies of assessment is not to make them go away' (57) Hollway observes. These limitations mean that psychometric testing cannot ultimately succeed in defining an individual because individuals do not exist in isolation and are not fixed. Claims for the efficacy of personality tests such as the 16PF, (a test of 'general personality') are rigid and essentialist, constructing ideas of personality that have no interaction or inter-relationship with contexts and temporal changes. Its formulations of personality are based on categorised, unambiguous responses to questions. Social or gender-based differences in response are not accounted for.

Hollway points out that the inextricable links between value and language are also overlooked by these tests, that psychometrics are based 'on the belief that words were transparent, only designating the 'things' or facts' to which they referred' (49). The belief in an essential, unambiguous meaning in words replicates the similarly naive belief in a core, rational and 'true' self.

Figure 4 below, a *repertory grid* test within the *South* book. Readers are invited to construct ‘hypotheses’ about their relationship to the South Bank environment. Many of these processes require physical engagement with the location, such as touch and movement.

Users respond to the words indicated by the arrows.

	1	2	3	4	5	6	7	8	9	
	Tower	Boat	Theatre	Egg	House	Sea-Shell	Museum	Pub	Bookshop	
functional	✓	✓	✗							magical

In the left side column write what it is the two elements have in common. For example ‘functional.’

Hollway qualifies her criticisms of personality tests by saying that within the terms defined by organisations psychometric tests may succeed, in the same sense that intelligence tests successfully define intelligence as the thing that intelligence tests determine. She concludes her chapter by stating that the accommodation of the complex socio-cultural relationality of subjectivity ‘does not result in an inevitable lack of agency. On the contrary, it can make change more possible when it analyses the real relations and thus devises methods, which do not conceal them’ (57). Hollway is calling for the recognition that the construction of the subject is never neutral, and, like Code, she sees this recognition as an opportunity that, in conjunction with methodologies that recognise their own specificity, can expand and fortify epistemic practices. Indeed the core of Hollway’s argument seems to be that personality testing methodologies should be recognised as the product of specific and locatable value systems and that these should be acknowledged.

My own practice hinges around the tensions inherent in the construction of subjectivity, but, as many of the writers I have referenced maintain, we cannot easily reach a consensus as to what a subject is or even if such an entity really exists. This ambiguity and fluidity is an instrumental presence within my practice, to quote Barbara Bolt, it is a practice in which 'the materials are not just passive objects to be used instrumentally by the artist, but rather the materials and processes of production have their own intelligence that comes into play' (Bolt, 2006: 1).

Changing the Subject and *Feminist Epistemologies* both present consistent arguments against unitary constructions of the subject that ignore the agency and fluidity of boundaries between social and political forces and individuals. The authors of these two works also question the neutrality of empirical scientific observers, or indeed the privileging of observation over practice. Both books emphasise the provenance of the supposedly neutral observer/practitioner as central to the production of subjectivity, but there is some tension around the degree to which empirical standards can and should be established. Interestingly it is *Feminist Epistemologies* that is most forceful in establishing a need for pragmatic, workable agreement within epistemological communities. These agreements may be fluid and culturally specific but without them there is no pragmatic resolution to the crisis of reason, and no means for generating change, for moving from a Marxist position¹¹ which might characterise individuals as either the victims or the benefactors of socio-politically agential forces, or a relativist position in which no epistemic commitments can be made. The following section explores some of the workable solutions that emerge from these texts.

New approaches to subjectivity

In her paper 'Taking Subjectivity into Account' (Alcoff, Potter, 1993), Code emphasises the need for a 'realist orientation' that prevents what she describes as a humanist 'slide into subjectivism' (20). Code talks of 'remapping the epistemic terrain' (20); this is a task that necessitates the fundamental recognition that there is

¹¹ See Balibar, 1995, *The Philosophy of Marx*, chapter 2, 'Changing the World, from Praxis to Production'.

no such thing as a neutral observer or a 'view from nowhere'. The erroneous presumption of gender neutrality is a particular target for Code's attack on Anglo-American epistemological traditions. At the same time, Code is wary of the homogenising dangers of making gender a closed category, and of all universalist approaches (particularly those of radical humanism) that essentially return to individualistic, rational and unitary conceptions of the subject. Code proposes that claims for objectivity in research should be supported by a situated analysis. Such an analysis would attempt to take its own subjectivity into account, to construct self-critical genealogies of enquiry. Code compares positivist epistemic paradigms, which are propositional, context-free and static, with the paradigm of inter-subjective interaction in which people are acknowledged to have certain qualities but are also recognised as never being fully fixed or complete.

The difficulty of negotiating the production of knowledge about individuals that is modelled on neither scientifically rationalist or entirely relativist schemas is particularly apparent in the context of my own work around generating and defining subjectivities. Harding's paper 'Rethinking Standpoint Epistemology: What is "Strong Objectivity"?' (49 - 82) presents an engaging yet theoretically problematic case for socially situated epistemological practices. Harding claims that standpoint epistemology (an epistemology that acknowledges and privileges certain positions as the point of epistemic reference) offers a more rigorous framework than 'spontaneous feminist empiricism', which, according to Harding, seems to wait for epistemic breakthroughs or shifts in thinking to occur within the orthodox contexts of empirical science (51). Standpoint epistemology characterises all knowledge as socially situated and particularly emphasises the importance of presenting marginalised perspectives as the 'ground' of new knowledge claims. (56). These claims according to Harding will have a maximum degree of objectivity while transforming socially situated knowledge into a 'systematically available scientific resource' (58). Harding insists, however, that standpoint theory is not a relativist theory; it is a theory that recognises 'certain situations are scientifically better than others as places from which to start off knowledge projects' (61). The subjects of such knowledge are embodied, multiple and contradictory, presenting a 'causal symmetry that reflects the sense that 'the same kinds of social forces that shape

objects of knowledge also shape (but do not determine) knowers and their scientific projects' (64). Harding presents reflexivity as a transformative resource, she is pragmatically concerned with the possibility of generating change. However, her notion that there are certain situations that can be scientifically privileged (on ethical grounds) over others, is not easy to justify.

Like Elizabeth Potter and Sandra Harding, Lynn Nelson stresses the epistemological agency of communities. Knowledge, according to Nelson, is connected to larger systems of theories and notions of evidence:

Standards of evidence and knowledge are historically relative and dynamic and of our own making. They are inherently and necessarily communal.

(142).

In stating this, Lynn Nelson is not arguing for a relativist position, but presenting a credible and topical argument for the recognition of what might also be thought of in computational or artificial intelligence terms as distributed or ambient intelligences, bottom-up models of knowledge production that are relational and fluid, rather than top-down *a priori*, rule-based systems of thought. As such Lynn Nelson's model of epistemological communities is one that appears to have some relevance within the context of my own practice. In placing communities as primary epistemological agents, Nelson is providing a pragmatic model for sourcing subjective meanings within a computational system, such a system would recognise and indeed be fuelled by what Lynn Nelson describes as an 'inherent circularity' or relational flux¹².

¹² Nelson writes of an embedded concentricity: 'what I have called the radical interdependence, between an epistemology and other knowledge undertakings [As I have argued elsewhere, we view the circularity here as vicious only if we assume (or demand) that epistemology justify what we know; a naturalized epistemology makes no pretence to be doing this]. The interdependence referred to is real, for in undertaking a project to understand the knowledge and standards accepted by another community or those of our own communities (and many of us belong to more than one), we may find that we need to alter the assumptions with which we began-to abandon some of the standards of evidence and/or revise our views of what we know' (Alcoff, Potter, 1993: 126). My practice is

One of my goals has been to create a reflexive computational system that can accommodate the type of epistemological shifts discussed in this review. Such a system should be able to reconfigure some of its own standards or presumptions if the agents that monitor it indicate the need for such an adjustment. Through my practice I have aimed to develop a form of contingent meaning making that is also emphasised, albeit in different terms, in the theoretical writings of Barad (2007).

The physicist and writer Karen Barad is concerned with discourses of causality and subjectivity. Her book *Meeting the Universe Halfway, Quantum Physics and the Entanglement of Matter and Meaning* (2007) follows what she calls a 'diffractive' methodology (according to Barad, *diffraction*, unlike *reflection*, implies the generation of new meanings beyond mirror images or reactions). Barad emphasises interdisciplinarity and considers specialised views from social and scientific fields across a broad range of areas, including quantum physics, feminism and post-structuralism. The idea of *differential intelligibility* is considered in light of Haraway's (1991) ideas about reflexivity, difference and diffraction¹³. In Barad's terms meaning emerges through embodied, temporally and materially specific, *intra-actions*, relational moments of meaning in which outcomes are not pre-determined or fixed. Barad examines and acknowledges the contribution of Niels Bohr but she also develops ideas that extend Bohr's attack on Cartesian subject-object boundaries through her notion of *agential-realism*, a form of knowledge production that is grounded in actions and a belief in material realities. Barad considers agential realism in light of specific considerations, including feminist ideas of performativity and the 'production of bodies, identities and subjectivities' (35). Barad applies her notion of causal entanglements to 'unresolved interpretational difficulties that have plagued quantum mechanics since its founding three-quarters of a century ago' (35). Barad is keen to emphasise that her ideas around agential realism are not restricted to cultural or philosophical readings but offer a new basis for interpretation within the field of

arguably engaged in a similarly circular (but explicitly material) form of meaning-making, one that does not imagine a point of epistemological or even performative resolution.

¹³ Haraway in (1991) is unequivocal in her call for an ethics of knowledge production: 'I am arguing for politics and epistemologies of location, positioning, and situating, where partiality and not universality is the condition of being heard to make rational knowledge claims. These are claims on people's lives; the view from a body, always a complex, contradictory, structuring and structured body, versus the view from above, from nowhere, from simplicity' (Haraway 191:195).

quantum physics. I would take this further and suggest that expanded ideas of causality and interaction are also relevant to digital works and to a reconsideration of interactivity in terms of its meanings, its goals and some of the orthodoxies that have established themselves in relation to notions of *the interactive*.

My own practice is grounded in a reconsideration of the ways in which interactivity can be deployed and defined, for example, decentralising the notion of individual user choice in favour of more collective processes and less overt or conventionally individualised forms of 'user' control. Wherever possible my own partiality of perspective, in the form of rules embedded in the code, can be examined and, where structurally possible, changed by readers.

Figure 5 Below, a screen shot from the *South* software. The system-rules are displayed, and the software agent changes these rules according to overall reader responses and situating events, such as economic and climactic changes and my own subjective weightings. Readers can also directly change these rules if they wish.



Current System Beliefs:

Camera ok
 There is no bus. Waiting for buses is bad
 Being cold is horrible.null
 News Logic: Rising energy costs 'affect NHS'
 Weather logic: Monday: cloudy, Max Temp:
 12°C (54°F), Min Temp: 9°C (48°F)

system rules

It is afternoon in South London. It is too cold for hanging around on bridges. The air is dry Oh no what a drag, you have been waiting for a bus for too long. You read your paper and try to make sense of it all. The news announces: "Rising energy costs 'affect NHS'"
 You cannot make sense of it. You read your star sign instead:
 Something tickles your intellectual side early today and might presage a new interest or hobby. Follow it up and see where it leads, but don't feel obligated to spend more time than you really feel like spending.
 It is daytime, there are always people around

Summary

The notion of a subject is dynamic and historically situated. The idea of a unitary, rational individual has reinforced biases in ostensibly objective methodologies, in particular the natural and psychological sciences, which have largely allowed the core notion of viewer neutrality to remain un-theorised even in light of radical breaks from this tradition represented for example, by theoretical physicists such as Niels Bohr. Many of the writers mentioned in this section of the review essentially call for an end to dualisms that spilt the individual from society and to the denial of observer bias. None of them imagine a methodology in which there is no bias, (unlike certain humanist proposals), but many of them, such as Harding, Code and Pyne Addelson call for the development of more complex methodologies that include a systematic account of the partiality of perspective inherent in any process of observation and its associated practices. The new epistemologies and paradigm shifts represented in these books offer a radical and significant contribution to our understanding of knowledge production. These theories relate very clearly to my own practice, not least of all to the possibility of formulating an alternative form of practice around subjectivity. My practice is built on the understanding that notions of subjectivity are inextricably bound up with all forms of epistemology and that all of these notions are (and always will be) non-neutral.

There are significant analogies between the ideas mentioned in this review and some of the more promising developments in more recent artificial intelligence practices. Although their provenance may not always be acknowledged, ideas of distributed, connectionist and collective intelligence strike me as having many resonances with feminist notions of reflexive and contextualised knowledge production. It seems that aspects of feminist theory are offering viable new paradigms and alternatives to the mind-body dualisms that have immobilised traditional artificial intelligence, particularly in terms of its top-down empiricist and unitary views of what constitutes knowledge, and indeed what constitutes a model of mind. The 'bottom-up', situated and embodied models proposed by feminist epistemologists appear to offer more useful paradigmatic starting points from which artificial intelligence projects might move forward. This review has examined these ideas and other key works, concepts

and references that have complemented the development of my practice, but as Barbara Bolt states (2006):

Words may allow us to articulate and communicate the realizations that happen through material thinking, but as a mode of thought, material thinking involves a particular responsiveness to or conjunction with the intelligence of materials and processes in practice. Material thinking is the magic of handling.

(Bolt, 2006: 1).

An epistemology based in practice is described by Barbara Bolt (2006) as a process of developing 'research pedagogies from the bottom up, rather than from the top down' (1). Contrary to the highly stylised form that a literature review, perhaps inevitably takes, the wider aim of this thesis has been to articulate the materials and processes with which I have sought to engender new forms of knowledge, not in the service of theory but in the production of a form of knowledge that, like the subjectivities I am interested in, emanates from the base of practice itself.

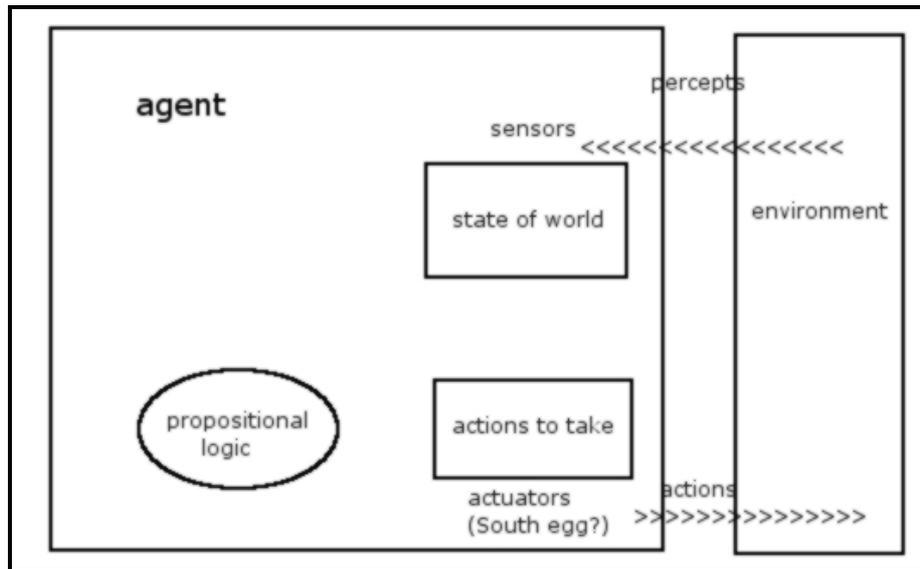
2.2: Digital fiction systems and agent based works

Introduction

My own software could be described as a *multi-agent* system, in which inter-dependent blocks of code make decisions on my behalf. The agents working on my behalf also represent my own partiality of perspective, the software I have written aims to expose and implement this partiality as a creative and provocative resource.

Figure 6 following page, a simple structure for a software agent. The agents operating within the *South* system work with psychometric data, CCTV images of the South Bank, news and

climactic data, tide tables and writing generated by readers. These are framed as environmental percepts.



The works I have focused upon in this section offer a critique of current and historical practices, including agent-based systems. *Cybertext* by Espen Aarseth (1997) presents a typology of textuality. Aarseth investigates the perceived and actual differences between diverse forms of fictional writing. *Cybertext* is particularly focused upon the range of critical reactions to ‘new’ or digitally mediated forms of narrative. Aarseth’s central question revolves around the applicability of old forms of literary theory to new forms of literature. *Narrative Intelligence*, edited by Phoebe Sengers and Michael Mateas (2003), is a more diverse work, offering multiple perspectives on current and historical developments into computationally generated narrative, and narrative agents. The breadth of *Narrative Intelligence* is an opportunity to explore a wide range of approaches to computational fiction and to establish a broad frame of reference for my own research. As mentioned, *Narrative Intelligence* also deals at length with a number of projects that are agent-based. These projects offer valuable case studies in relation to my own practice.

It is important to point out that the breadth of this review exemplifies the interdisciplinary basis of the *South* project. All of the works cited have provided methodological as well as theoretical insights of relevance to the project. As such

this section provides a useful and unifying bridge between these diverse aspects of my PhD, a connection between its theoretical, technical and pragmatic contexts.

Part I:

What are digital fiction systems? Definitions and criticisms of ‘traditional’ and current approaches

Both *Cybertexts* and *Narrative Intelligence* stress the historical continuity of story telling within human culture; indeed Kerstin Dautenhan in chapter four of *Narrative Intelligence*, ‘Stories of Lemurs and Robots, the Social Origins of story-telling’ (Mateas, Sengers, 2003: 63) examines the roots of story telling within non-human primate societies. Likewise Aarseth continually emphasises the longevity of narrative and emphasises the inadequacy of certain paradigms that have been cited as the distinguishing features that separate new forms of writing from traditional narrative. Aarseth is more concerned with a continuum of discourse around communication rather than establishing schismatic or oppositional categories of literature. If there are significant differences, Aarseth states, they are ‘differences in teleological organization’ (Aarseth 1997: 20).

In identifying subtler levels of medium specificity Aarseth asks us to expand our categorisations of what constitutes literature and of ‘what is literary’ (23). These emerging categorisations necessitate a new literary aesthetic and an awareness of the dangers inherent in imposing (without questioning their pertinence) naturalised literary terms onto new forms of textuality. Throughout *Cybertexts* Aarseth questions the meaning of reified terms, such as *non-linearity*, *interactivity*, and *narrative*. Early in his book Aarseth establishes the term ‘cybertext’ to define texts that he defines as placing the reader in an overtly exploratory role. Aarseth makes the controversial claim that *cybertexts* are texts that grant the reader an agency beyond the degree of responsibility conceded by reader response theory, in which the reader is defined as having a high degree of control in extracting meaning from

texts¹⁴. These claims should be seen as one aspect of a wider context that involves widespread debates about agency in the reader-writer nexus, often defined in

Quick start:

Before undertaking the core algorithms presented in this book the reader should complete a series of processes. These processes will help the *South* system to construct a hypothesis about you, or, what my grandfather called a *psychogenic topology*. Some of these processes take the form of 'repertory grid' tests, the investigation of your own networks of beliefs, which may also be called *constructs* (Exactly how you use these tests will be explained in great detail). Other processes may be more familiar.

Most of these processes use *bipolar scaling methods*, identifying the magnetic attraction of dichotomous concepts, discovering which pole a particular notion pulls you towards. Oddly numbered scales do not allow for equatorial malingering. Your ontological commitment is required at all times.

Figure 6a a page from *South, a Psychometric Text Adventure*.

¹⁴ The key theorists of reader-response theory are Stanley Fish, Wolfgang Iser and Norman Holland; their theories were developed from the 1960s onwards.

polarised terms that characterise 'passive' and 'active' engagement with texts (see Landow, (1992), Bolter, (1991), Dovey et al (2003) for a range of positions across this debate). Aarseth states that the reader is largely responsible for defining the passage of a cybertext. I will clarify the term here because it is clearly central to Aarseth's thesis. As its name implies a cybertext involves cybernetic processes, an exchange of control through cycles of feedback. Aarseth has derived this term from Norbert Wiener's influential book, *Cybernetics, Control and Communication in the Animal and the Machine* (1948). *Cybertexts* also involve a process of calculation, but the notion of a cybertext does not implicitly point to a digital form of delivery or construction. 'Paper' writes Aarseth, 'can hold its own against the computer as a technology of ergodic text'¹⁵ (Aarseth, p.10). The ancient form of the *I Ching* (circa 1122-256 B.C.) is cited as an example of a non-digital cybertext.

Narrative Intelligence approaches the meaning of digital story telling from a different perspective. The book is introduced with a brief survey outlining the role of narrative investigation in early artificial intelligence research. This research explored the idea of narrative frameworks as a core facet of human intelligence and theories of mind. Early research in this era was conducted by Roger Schank at Yale University and by the designers of such systems as SAM, the 'Story Understanding System', Cullingford (1981), PAM, Wilensky, (1981) and Tale-Spin, Meehan (1977). Though these projects were diverse and imaginative they were subject to the same cut-backs that were applied to other artificial intelligence projects within the so-called *AI Winter*:

These early narrative systems fell out of favour, suffering the same fate that befell many 70's AI systems. They were intensely knowledge based, which meant that they functioned only in very limited domains and could be made more general only by intensive and probably eventually infeasible knowledge engineering process.

(Mateas, Sengers: 2003: 2).

¹⁵ The term *ergodic* is used by Aarseth to imply texts in which the reader must work to find a path, in which 'nontrivial effort is required to allow the reader to traverse the text' (Aarseth, 1997: 1 – 2). The word *ergodic* is a combination of the Greek words for *work* and *path*.

Despite the *AI Winter* (in which support for artificial intelligence research dwindled), there was a growing interest in narrative psychology and human-computer-interaction, which revived research in story-telling during the 1980s. This interest was connected to a wider concern with 'humanistic perspectives' (3) and to the context of interaction as part of a broader notion of what constitutes a computational (or psychological) interface, and to ideas that construct the 'context' itself as a form of interface. In this sense, narrative was emerging as not merely an individualised activity but as part of a wider social and cultural network of meaning.

Mateas and Sengers identify research into narrative and artificial intelligence as particularly suited to an interdisciplinary trope, providing fertile ground for the expansion of complexities such as 'designing computational artefacts for and within cultural contexts' (4). The interdisciplinary nature of research into computational and 'intelligent' narrative has informed the structure of *Narrative Intelligence*, in which a diverse range of subjects are covered. *Cybertexts* is arranged around categories of cybertext including hypertext fiction, adventure games, multi user dungeons (MUDs) as well as a chapter on interaction and another chapter concerning Aarseth's textonomy, or typology of textual communication. Both books are at times concerned with the increasingly contested and clouded boundaries between readers (or users) and consumers, and also of ambivalent categories such as those of 'author' and 'writer'.

Aarseth's work is particularly concerned with theoretical definitions and the construction of typologies relating to digital fiction. Aarseth also asks how new literary forms, or cybertexts, fit into dominant literary and cultural theories. *Cybertexts* investigates medium-specific and structurally specific aspects of writing. *Narrative Intelligence* engages with some of these issues but also with the limitations of computational paradigms, particularly the conceptual models that have emerged from traditional artificial intelligence research.

A critique of traditional AI agent structures

'Schizophrenia and Narrative in Artificial Agents', by Phoebe Sengers (chapter 16 of *Narrative Intelligence*) outlines some of these limitations in more detail, examining the 'something deeply missing' (Sengers, Mateas, 2003: 259) or more specifically the something deeply missing from 'the currently dominant ways of building artificial agents' (259). Sengers' critique of conventional agent design is of particular relevance to my own practice. The *South* system consists of multiple agents, including overtly subjective agents that interact with human agents and modules of code that perform small cooperative functions within the system. Sengers presents a coherent critique of so-called 'divide and conquer' software design practices, explaining how they can contribute to the creation of fragmented and systemically constrained agents. The *divide and conquer* approach is a way of dealing with complexity in computer programs by abstracting problems into smaller and smaller units or sub-problems. One could argue (as Sengers does) that both detail and larger meaning is lost in this methodology, that the *gestalt* of *divide and conquer* design is actually a series of fractured black boxes, often produced by people who have no knowledge of how the other parts, the sub and sub-sub problems, in the overall design work. Sengers' argument is that these types of structure when applied to agent design result in depersonalised fragmented behaviours, and that the modularity of such designs is a systemic limitation (259 – 260). Sengers states:

Some practitioners have argued that the various components of an agent strongly constrain one another, and that the complex functionalities of classical AI could come up with could not easily be coordinated into a whole system.

(260).

Sengers relates this methodology and its outcome to institutional psychiatry and suggests that the underlying problem is a deep-seated lack of narrative understanding. Sengers cites the roboticist Rodney Brooks' observation that

alternative forms of *behavioural* AI also present problems of integration. Brooks notes that using more than a dozen or so agents is problematic, as the more behaviours you add the more things tend to 'fall apart' (260). One could argue that the use of the term *schizophrenic* has far too much obfuscation, stereotype and tabloid value to be fluently 'read off' into problems of software design. However, Sengers' point about *divide and conquer* methodologies and the importance of narrative understanding is valuable.

Figure 7 Below, an example of an algorithm embedded in the *South* software, it counts the number of words a reader uses and makes assumptions about them based on its calculation.

```
/**
 * countWords() count words in any .txt file used to assess user      * input
 *
 * @param String txt - name of .txt file to read
 * @return int -number of words
 */

public int countWords(String txt) {

    int numo;

    String a = "";
    String lines[] = loadStrings(txt + ".txt");

    for (int i = 0; i < lines.length; i++) {
        a = join(lines, " ");
    }

    String[] list = split(a, " ");
    numo = list.length;
    print(" " + numo + " ");
    return numo;
}
```

My own emphasis on subjectivity may be seen as a form of narrative production, re-framing 'psychometric' data as a new form of story telling (likewise my fictional character Ivan Dâr reframes his own psychological condition as a narrative of exploration). My interpretation and use of psychometric data is comparable to Sengers' notion of comprehensibility in narrative agent architecture. Sengers outlines the key properties that agents should have to support narrative comprehension, citing her own *Expressivator* project, in which agent behaviours are coherently integrated across narrative sequences. Sengers, in common with the *South* system, also emphasises cultural context as a key to narrative coherence.

Types of digital text

While Sengers pinpoints narrative intelligibility as a key solution to problems of dislocation in narrative agent architecture, Aarseth asks the more fundamental question: what actually constitutes a text or a narrative? Aarseth is keen to shatter certain illusions about the formal differences between digital and traditional texts, and to underline the vagueness of certain terms that have been uncritically inherited from the commercial computing world, such as "interface", 'hypertext', 'interactive' and 'virtual' (Aarseth 1997: 59).

Aarseth begins his own analysis of cybertext by looking at a previous text typology undertaken by Michael Joyce in 1988. Michael Joyce identified a distinction between texts that can be explored versus texts that can be 'changed, added to and reorganised by the reader' (60). However, Aarseth concedes that *text* cannot ultimately be defined and admits that pragmatic accommodations had to be made in constructing his own typology (62). Aarseth's *textonomy* involves a complex and fluid categorisation of types of texts and variables that apply to them such as determinability and transience. A particularly subversive and refreshing argument made by Aarseth is that hypertexts are 'more, not less linear than the codex' (65). Writers cannot control the way in which readers traverse traditional books. These may be described as *random access works*, whereas linking and conditional branching can certainly constrain the way in which a reader traverses hypertext works:

The reader's freedom from linear sequence, which is often held up as the political and cognitive strength of hypertext, is a promise easily restricted and wholly dependent on the hypertext system in question.

(Aarseth 1997: 77).

For a text to qualify as *ergodic* it must meet one of the user functions defined by Aarseth, including an aspect of calculation. Cybertexts must also generate a cybernetic feedback loop between the reader and the text. Again Aarseth emphasises that this is not the exclusive domain of digital texts (and that it is arguably a feature of all texts). Aarseth cites the *I Ching* (circa 1000 BC) as, by his own strict specifications, a fully qualified cybertext, and as such the oldest text he can identify that meets his criteria. Aarseth also identifies Joseph Weizenbaum's *Eliza* (an early form of what would now be called a *chatbot*) and John Cayley's 1995 work *Book Unbound*. This is a digital work that consists of a 'holographic sentence generator that merges and mutates other texts, inviting readers to feed their favourite results back into the system' (67). Both of these works, particularly *Eliza*, are relevant reference works in relation to my own practice. Their interest to me is as works that may be viewed as inter-subjective and temporal. The combination of user interaction and stochastic processes is able to engender unrepeatable narrative sequences, writings that are in and of their specific time and place. This relational convergence and entanglement of events is not the same as claiming that some sort of democratic 'co-production' between readers and writers is occurring. Such a notion, is, according to Aarseth, part of the mythology of hypertext fiction, and has been a key factor in claims that hypertextual structures are somehow more suited to human cognitive processes (whatever they may be) than traditional texts. But, as Aarseth clearly maintains throughout *Cybertext*, the differences between hypertext and what he frequently alludes to as 'the codex' are overblown. Aarseth warns us that 'identical signifiers do not guarantee identical meanings' (84). He also asks what a *narrative* is. Aarseth suggests that the hypertext theorist and author George

Landow (1991) has confused 'fiction and narrative' (84). These are not the same entities Aarseth states: one describes content while the other describes form¹⁶.

Like a number of the projects featured in *Narrative Intelligence*, such as 'Agneta and Frida' and 'Terminal Time', Aarseth also challenges the term 'interactive'. Chapter 8 of *Cybertext, Ruling the Reader: The Politics of Interaction* investigates the ambivalent boundaries between users, consumers and producers; 'to elevate a consumer group to producerhood' Aarseth writes, 'is a bold political statement; and in the production and consumption of symbolic artefacts (texts) the boundary between these positions becomes a highly contested ground' (Aarseth 1997: 163). *Cybertexts* adds more complexity to this already ambivalent area. Interaction with *cybertexts* may be interpreted as 'empowering' or 'authoritarian' (163), but Aarseth again warns us of the danger inherent in applying terms from traditional literary theory to new forms of literature, and suggests that our understanding of 'agency' requires rethinking. Aarseth is also wary of technological determinism, citing George Landow for his claims that hypertext is somehow a democratising force. It is the individual, Aarseth writes, not technology or interactivity that can bring about institutional reform; such reform could be equally well managed with a pen and paper.

Chris Crawford, creator of the *Erasmatron* storytelling system, describes the 'misuse' of the term 'interactivity' (191) and the notion of choice:

I need only assert one characteristic of interactivity: it mandates choice for the user. Every interactive application must give its user a reasonable amount of choice. No choice, no interactivity. This is not a rule of thumb; it is an absolute, uncompromising principle.

(Crawford in Sengers, Mateas, 2003: 191).

¹⁶ The question of what constitutes *narrative* is also discussed at length in regard to computational works in Perron et al (2003), while a more orthodox definition can be found in Toolan (1992), though Toolan also recognises that there are no unequivocal definitions. 'A first attempt at a minimalist definition of narrative might be: I a perceived sequence of non-randomly connected events.' (Toolan, 1992:7). Toolan also states that the term *event* opens up further areas of complexity.

His critique of interactivity consists of pinpointing the lack of choice in many systems and even inanimate objects that claim they are interactive, including bottles of shampoo, rugs and candy bars. 'With any given dramatic situation, our user can imagine a great many possibilities...our task', Crawford writes, 'is to provide as many of those possibilities as is reasonable' (192). But his critique leaves the conception of choice un-theorised: what is choice and is 'choice' really at the heart of interactivity? Do we really want to make choice the ultimate goal of all new forms of digital fiction? Crawford's belief in 'choice' is matched by a deterministic belief in the expressive power of computers; he states that a 'general purpose' programming language can code anything, that its limitless potential is only held back by human users:

There can be no doubt that C++ has the expressive potential to write a program capable of, say, writing profound novels.

(Crawford in Sengers, Mateas, 2003: 195).

It is hard to find any evidence to support Crawford's belief in the limitless potential of programming languages, let alone their ability to write coherent or even 'profound' novels. While Crawford suggests that it is humans who limit the potential of technology (as opposed to any inherent creative deficiencies in a rule-based system), Sengers cites the 'missing juice' of traditional AI as narrative cohesion. I would also argue that other crucially missing elements are embodiment, the 'irrational', tacit knowledge and, perhaps most crucial of all, the situated knowledge outlined by Haraway (1991) and extended by Barad (2007) as discussed earlier in this review. Crawford's statement epitomises the disembodiment and technological determinism that have limited traditional artificial intelligence to ever-expanding, monolithic knowledge-based systems that know nothing of situation or embodiment.

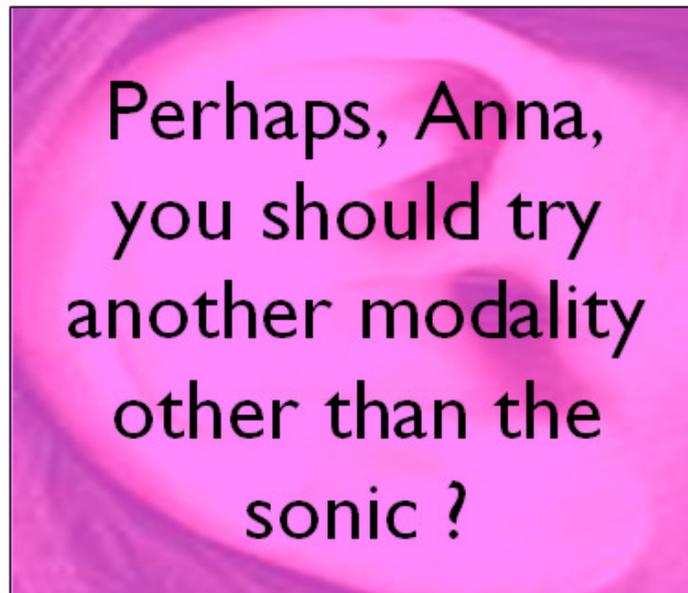


Figure 8 Above, subject specific content generated by the *South* software

Though the interdisciplinary breadth of *Narrative Intelligence* is useful, too few of the contributors engage critically with issues of epistemology, embodiment and agency. Neither *Narrative Intelligence* nor *Cybertext* provide an extensive critical challenge to the implicit dualism of binary notions such as ‘the user’ and their ‘context’ (and, in fairness, this was never their stated intention). It could be argued that many of the works referenced in these two books reinforce this dualism, and that it is implicit in works that refer to *humanism* or the *humanistic* (Sengers, Mateas, 2003: 3). My review of subjectivity explains in more detail how humanism is still entrenched in reified notions of a unitary, rational and essentially solipsistic idealisation of individuals. This notion of the individual is problematically predicated on a mind-body dualism, and establishes the impression of the neutral knower, the scientific observer of positivist foundationalism (sometimes referred to as the *Cogito*) for whom universal truths are rationally self-evident.

Haraway’s notion of situated knowledge (and also Lynn Hankinson Nelson’s related conception of communal epistemologies) still emerges as the most viable epistemological alternative to the problematic ‘*Cogito*’, pragmatically, ethically and theoretically. Haraway’s notion of situatedness is extended and supported by Lucy

Suchman, a Professor of the Anthropology of Science and Technology at Lancaster University. Suchman challenges orthodox notions of the boundaries between subjects and objects and writes of the 'reconstructive engagement with received conceptions of the human, the technological and the relations between them' (Suchman, 2005: 1). Suchman's exploration of such issues within the domain of robotics and artificial intelligence has lead her to a position which emphasises sociality 'in strong contrast to prevailing models of the individual cogniser as the origin point for rational action' (3). Between Suchman, Barad and Haraway new epistemological theories are being forged, and, through the materials and processes of an informed practice, new computational systems of production can be conceived.

The second part of this review will look at projects that have approached narrative generation from a more situated and reflexive position, such as the challenging conception of interactivity presented in *The Rise and Fall of Black Flag, Terminal Time* (Sheldon Schiffer, 1999 - ongoing) and Per Persson's, Kristina Höök's and Marie Sjölander's *Agneta and Frida* project (1999).

Part 2: New approaches to digital fiction systems

The first part of this review identified areas of tension and difficulty in the field of electronic literature, in particular some of the structural problems inherent in using traditional computational practices that emerged from artificial intelligence research in the 1970s. Sengers emphasises context-sensitivity as an alternative to modularised, fixed and fragmented blocks of code. Sengers calls for software designs that accommodate contextual mutability as well as 'the background, assumptions, knowledge and perspective of the interpreter. In order to design narratively expressive agents, designers must respect (rather than attempt to override) the context-and-audience-dependency of narrative comprehension' (267).

Where I would depart from Sengers (and from almost all of the contributors to *Narrative Intelligence*), and also with Aarseth, is in the epistemological construction of

context¹⁷. My interest is in the distribution and form of these normalised boundaries such as those between a context and a user, and in the perspective and partiality of these notions.

Haraway has stated that in undertaking a reformulation of epistemology we need to exercise a complex mobility of meaning: 'It is not enough to show radical historical contingency and modes of construction for everything' (Haraway 1991: 187). What is needed is a 'successor science project that offers a more adequate, richer, better account of a world, in order to live in it well and in critical, reflexive relation to our own as well as others' practices of domination and the unequal parts of privilege and oppression that make up all positions' (187). Haraway urges us to ground a successor science in an embodied form of objectivity, but it is a form of grounding that is not about 'fixed location in a reified body, female or otherwise, but about nodes in fields, inflections in orientations, and responsibility for difference in material-semiotic fields of meaning. Embodiment is significant prosthesis; objectivity cannot be about fixed vision when what counts as an object is precisely what history turns out to be about' (Haraway 1991: 195). My understanding of this embodied form of objectivity is that we cannot assume a universal conception of what it is to be human or to have a body, and that therefore our objectivity is in itself inevitably situated, always located and always partial:

I am arguing for politics and epistemologies of location, positioning, and situating, where partiality and not universality is the condition of being heard to make rational knowledge claims.

(Haraway 1991: 195).

My aim has been to find ways of constructing situating computational processes, avoiding the structural failings Sengers touches upon, while developing and deploying a form of software that is grounded in epistemologies of location.

¹⁷ The *South* system partially constructs *context* through the subjectivity of readers and through wider situating agencies. We, meaning readers, myself as a programmer and the wider agencies at play are 'the context' or environment for this system.

Agent-based projects

Narrative Intelligence describes a number of projects that appear to have loosely related goals. The *Agneta and Frida* project (Per Persson, Kristina Höök and Marie Sjölander ,1997-1999) consists of two cartoon characters or agents, Agneta and Frida, who 'sit' on the computer 'desktop' accompanying individuals as they browse or 'surf' the web. As users visit different sites Agneta and Frida appear to be watching the material like television viewers, making sarcastic and critical comments about the content while continuing with their own lives, going to the toilet, having disagreements and picking their noses, constructing both a meta-narrative, a narrative about the web material, and a soap-opera like narrative about their own lives. In this way *Agenta and Frida* is a project that encompasses a critique of the notion of choice, digital consumerism and interactivity, though its stated intention is to explore the way in which narrative coherence is generated, in particular the 'gap filling readers appear to undertake' (Sengers, Mateas 2003: 246). The designers of this project, Per Persson, Kristina Höök and Marie Sjölander write that within a narrative context 'Inferences and relationships are not primarily textual phenomena, but mental ones.' (246):

They are not 'in the text', but exist rather as readers constructions during and after the course of the story.

(246).

After extensive user evaluation the designers of the project concluded that the dual narratives resulted in a rupture between the web content and the agents. Rather than unifying the experience of browsing the web by bringing narrative clarity to disparate content, as they had intended, 'Subjects in our study did not gracefully merge Agneta and Frida and the web content into a narrative whole' (256). Interestingly the designers also reflected that contextual, or socio-cultural parameters, needed to be taken into account in evaluating the system, particularly in relation to humour. There is a sense that in recognising the cultural specificity of

their work the designers are problematising it, as if it could ever somehow be culturally neutral. As stated at the beginning of this review, a key goal for my own work has been the visibility of non-neutral (and therefore subjective) material embedded within the programmatic structures of my software, these subjective structures act as a type of protagonist within the work, but they are also open to a degree of modification by readers.

Sengers' *Expressivator* (1999) is an agent architecture that also focuses upon the 'personality' and narrative expression of agents. As explored in part I of this review Sengers identifies the lack of narrative comprehensibility as a major failing of the modularised architectures of conventional AI agents. According to Sengers the *Expressivator* as a character, 'attempts to eke out a miserable existence while being bullied by the Overseer' (267), while as a software system *The Expressivator* implements both a sign management system (a system that accommodates the complexity and mutability of meanings, particularly their 'context-dependency') and overarching or meta-level controls for generating intelligible transitions between agent behaviours. This structure integrates behaviours beyond merely explaining what an agent is *doing* but also the reasons for an agent's actions.

The Rise and Fall of Black Velvet Flag (Sheldon Schiffer, 1999 - ongoing) also presents a reflexive storytelling system that is aware of its own context-dependence. The project consists of a database driven interface for generating documentaries, designed by Sheldon Schiffer at Georgia State University. Sheldon Schiffer begins his paper with the recognition of the inherent difficulty and non-neutrality of forming ontologies. Schiffer provides a valuable insight in stating that he does not agree with Lev Manovich that the process of retrieving data from a database is immune to implicit orderings, instead Schiffer states that the logic of the ordering imposes a form of narrative. Schiffer's system also self-consciously deploys non-neutral alternatives to the documentary form, highlighting the partiality of all supposedly objective documentary-making processes. Schiffer refers to the 'propagandistic algorithm' (148) of Roosevelt era documentary film making, and to Frank Capra's second-world war documentary *Why We Fight* as 'a pre-digital model of the database as a mechanism for the production of documentary' (148). The processual

transparency of Schiffer's work is a provocative challenge to conventional forms of documentary filmmaking and a valuable reference for my own practice.

Terminal Time by Michael Mateas, Steffi Domike and Paul Vanouse (1999) is a project that also explores and challenges the neutrality of documentary film-making processes. 'The Recombinant History Apparatus Presents Terminal Time', chapter 9 of *Narrative Intelligence*, describes the project as 'a history "engine:" a machine which combines historical events, ideological rhetoric, familiar forms of TV documentary, consumer polls and artificial intelligence algorithms to create hybrid cinematic audiences that are different every time' (155). *Terminal Time* is also engaged with a critique of the rhetoric of choice, and of corporate media dominance, which they describe as keeping 'innovative and critical historical documentaries, as well as media of other genres, from reaching the public' (159). The authors identify many of the myths embedded in the notion of choice, which they characterise as 'rhetoric of utopian navigation' (162) according to which:

The computer provides unlimited access to information and experience, a pure source of empowerment that imposes no interpretation on the data that is processed.

(162).

The authors also highlight the exploitation of user interaction, this is described as 'the raw material for corporate data collection' (162). This approach has resonance with my own practices, such as the overt deployment and feeding back into the *South* system of market research and psychometric methodologies. *Terminal Time* uses audience polling and demographic data collection as a way of constructing unintended or atypical histories. But Mateas, Domike and Vanouse are keen to emphasise that *Terminal Time* is not purely an exercise in cynical commentary but an 'exploration of some of the unexamined assumptions and unintended side effects of information technology' (162), including the myth of neutrality or the idea of the computer as a value-free conduit for unfettered user agency.

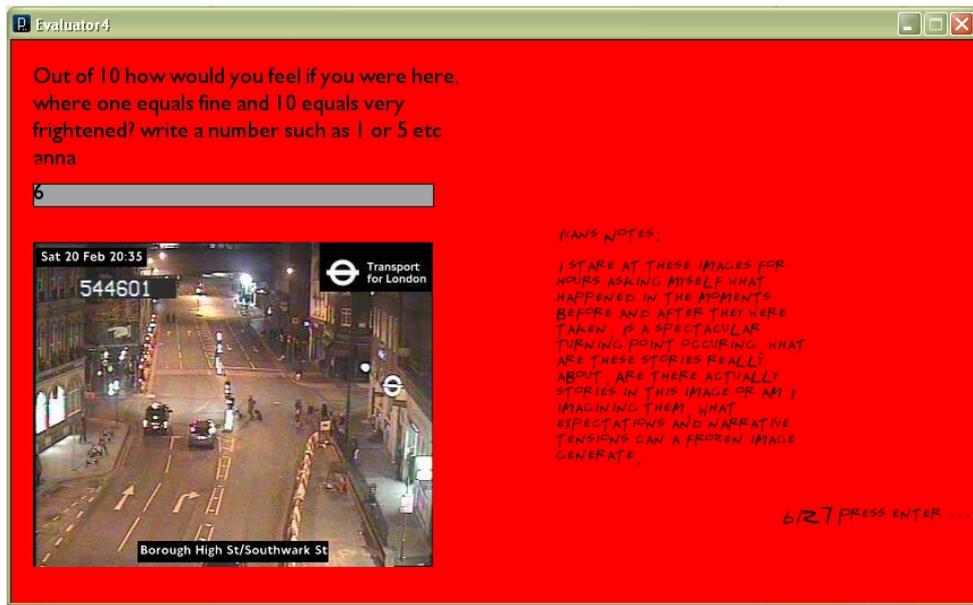


Figure 9 Above, a screen-shot from the *South* evaluation software. The software asks readers to measure their emotional response to ‘real time’ CCTV images.

Terminal Time is particularly engaging in its recognition of artificial intelligence systems as cultural artefacts and in its conception of expressive AI, in which the concern is not with an autonomous system but a system that engages in a form of relational performance: ‘Expressive AI views a system as a performance. Within a performative space...Expressive AI thus changes the focus from the system as a thing in itself (presumably demonstrating some essential feature of intelligence), to the system as a communication between author and audience’ (167). Despite the pluralist discourse of advertisers and technological determinists, the creators of this project ask the crucial question: *what is not allowed by a computer system?* (163). This question can be applied to any computer system. What types of behaviour and information are excluded beneath the apparently participatory design? What are the built-in boundaries of its design? *Terminal Time* is built with recognition that systems are the ‘active messengers of a worldview’ (163). Its architecture consists of modules or major code components described as rhetorical or ideological goal trees. *Terminal Time* appears to be amongst the most keenly critical works featured in either *Narrative Intelligence* or *Cybertexts*.

It is interesting to note that Domike, Mateas and Vanouse reject a strongly emergent architecture, which they describe as a ‘form of rootless non-intention’ (168). Their critique is important to my own work, as a decentralised, more widely distributed system is key to my design, but it is not one that I would describe as *emergent*, for similar reasons. Domike, Mateas and Vanouse rely heavily on a top-down, high-level knowledge base within the *Terminal Time* architecture. Their choice of such a high level system is confusingly defined by motivations that are similar to Sengers’ incentives for making use of less centralised forms of architecture. Mateas, Domike and Vanouse reject ‘strongly emergent’ processes, which, they state, lack authorial ‘hooks’:

Much of the architectural work that went into the iterative prototyping of *Terminal Time* was a search for an architecture providing authorial “hooks” on the right level of abstraction: fine-grained enough to allow significant combinatorial possibilities and the capability for surprise, yet providing the appropriate authorial affordances to allow the exertion of authorial control over multiple levels of the story construction process.

(168).

The notion of authorial “hooks” seems strikingly similar to Sengers’ emphasis on narrative coherence, yet her intention is to avoid the fragmentation and loss of narrative intelligibility that is often the result of traditional AI architectures (though she is particularly concerned with agent architectures). My own system deploys bottom-up, simple agent structures where practicable. Though I take the point made by the designers of *Terminal Time* that emergence is a problematic form of authorship, I would contend that my system deploys these more distributed structures in a different form¹⁸. My interest is in what Karen Barad describes as

¹⁸ Espen Aarseth identifies MUD (or multi User Dungeon games) as a particularly subversive form of textuality, though there is not room in this review to go into MUD games in detail, I wonder if they might also have a closer relationship to notions of emergence and things-in-phenomena than the works that arise from the top-down architectural systems used by Mateas, Domike and Vanouse?

differential patterns of mattering (Barad 2007: 140) or of 'things-in-phenomena'. In (2007) Barad writes:

relata do not pre-exist relations; rather, relata-within-phenomena emerge through specific intra-actions. Crucially, then, intra-actions enact agential-separability – the condition of exteriority-within-phenomena. The notion of agential separability is of fundamental importance, for, in the absence of a classical ontological condition of exteriority between observer and observed, it provides an alternative ontological condition for the possibility of objectivity.

(Barad 2007: 140).

I do not have any commitment to or interest in the notion of emergence for its own sake, rather I have a commitment to systems that (wherever possible) try to eschew predefined boundaries between users and contexts, or society/individual dualisms; a form of contingent meaning-making that is closer to the description made by Sarah Kember (2003), in relation to artificial intelligence and Alife, in which emergence is characterised as 'based on a non-linear, non-deterministic model of connection or communication between multiple rather than individual units' (Kember 2003: 110). This description seems to directly address the problems outlined by Sengers in chapter 16 of *Narrative Intelligence*, though, as noted before, it is significant that other designers have chosen contrary solutions, highlighting the unavoidable fact that these are undoubtedly difficult, complex and often-contradictory areas. Above all I want to avoid falling into an entrenched position in regard to the architecture and sensibility of my own system. In *Cyberfeminism and Artificial Life*, Sarah Kember (2003) discusses the limitations and structures of artificial agents, including Rodney Brooks' downsized 'dumb' mobile robots, or multi-agent system, which *en masse* might constitute a 'political economy of information systems' (Kember 2003: 119). Brooks' *robots* have eschewed symbolic internal models and have instead adopted a networked intelligence or 'subsumption architecture'. Though this is an interesting break from the symbolic models of traditional artificial intelligence it is my understanding that this is pragmatically a very limited architecture.

Sarah Kember (2003) also discusses the disappointing limitations of 'trick' conversational agents or chat bots such as *Eliza* and *Julia* that have limited repertoires of static responses and no capacity to learn or analyse their own reactions let alone act in situated awareness of an environment. One of the issues of interest to me is the 'best practice' paradigm that habitually reverts to face-to-face intra-human experience as the ideal form of interaction, placing, for example, the intra-human flow of a chat site above the 'question and response' pattern of an online bulletin board' (Dovey, Giddings, Grant, Kelly, Lister 2003: 22). These anthropomorphic value judgments do not always seem logical or necessary but as the authors point out, the anthropomorphising sensibility 'inflects the whole idea of interactivity by lending it a context of person-to-person connection' (22). This is perhaps where chat bots from *Eliza* onwards have failed both in intention and practice, pursuing a mimetic or anthropomorphic goal at the expense of exploring the true strengths of computational forms and structures.

Hayles (1999) describes the distributed and situated paradigm represented by Rodney Brooks' subsumption architecture as offering an alternative approach to exploring artificial intelligences and narratives of cognition; an approach that does not form itself around a central (or computational) conceptual model of 'reality' or 'mind', but sensory interaction with environments and distributed cognitive structures. Hayles enlarges upon the crucial observation that Dawkins, Minsky and many other scientists create anthropomorphic narratives of agency. Hayles references Stefan Helmreich's anthropological observations of artificial life researchers, in *Silicon Second Nature, Culturing Artificial Life in a Digital World* (1998) in which Helmreich records the closed paradigms that A-life scientists habitually construct, interpreting the universe as a mathematical construct, a realm of information. Other scientists such as William Grey Walters work with the awareness that they are creating systems designed to model anthropomorphic strategies. If "we ask how this narrative is constituted" Hayles writes, "we can see that statements about the operation of the program and interpretations of its meaning are in continuous interplay with each other" (Hayles 1999: 227).

Summary

The complex interplay of computational writing, subjectivity and agency presented in this review highlights many of the key issues raised within my practice and theoretical research. From the outset I knew that in pursuing this practice I wanted to address some of the issues arising from the impasse in traditional artificial intelligence practices. This impasse is characterised by top-down, centralist, rule-based systems whose modular and fragmented construction sometimes results, particularly in the domain of agents and narrative generation, in disjointed and impersonal works.

In creating my own software there are many questions I have attempted to answer, such as, how, for example, might I accommodate the recognition that I am producing an unavoidably partial notion of a subject and how do these theories relate to the design of interactive software or 'ergodic' fictions described by Aarseth (1997). Aarseth's notion of cybertext is that 'the subject' must work to find a path through a story, but in some ways my fiction inverts the ergodic trope identified by Aarseth, and is instead constructing a literature which must work to find its subject. However, I have sought to recognise that the 'subject' is both historically and dynamically brought into being. The subject within my work is relational, contradictory and mutable. That realisation is embedded within my code, but it is not integrated as a form of illustration, rather as knowledge generated in and through specific creative practices, some of which I have outlined within this review. What is clear from the readings and research I have undertaken in forming this review is the need for subtlety in the ways in which we theorise and produce new forms of fictional text, and for greater subtlety still in our ability to discern what exactly constitutes both a *new* form of text and a significantly new form of computer-human intra-action.

2.3: Readers and writers, hypertext theories, site-specific art works, pervasive games and artist's books

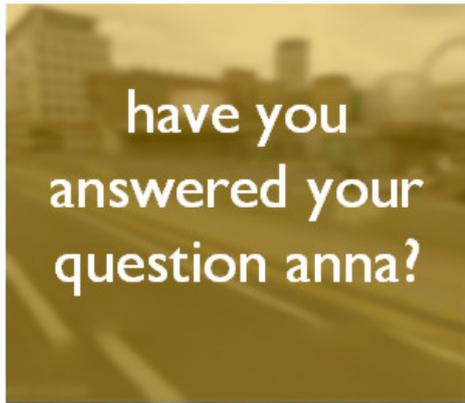
Introduction

The discourses around the role of the author exemplified in Roland Barthes' 1967 essay *The Death of the Author*, and in Foucault (1977) and Derrida (1967), were central to hypertext theories that emerged in the late 1980's and 1990's, and, as I will show in this section of the review, relate directly to theories of the subject. This section will also explore discourses around authorship and site specificity evident in more recent forms of digital art such as *augmented or mixed reality games*¹⁹. Like the other sections of this review, this part will show the relationship between my theoretical research and practice. It will summarise what I have accepted and rejected from the material I have researched and show how it relates to the theoretical and practice-based content of my work. This part of the review engages in particular with the writings of early hypertext theorists, who often conflated hypertext and non-linearity with post-structuralist theory. Writers such as Jay David Bolter (1991) and George Landow (1992) have boldly presented hypertext as the embodiment of post-modern theories. Such literalising of the relationship between practice and theory is a valuable *warning by example* to any practitioner in this field. Examining the mistakes and hyperbolic claims made by early hypertext theorists highlights these dangers. Such an examination also highlights many of the humanistic errors made in the limited designation of agency, and narrowly deterministic notions of subject-object differentiation. These issues were examined in relation to subjectivity and cybertext systems in the previous sections of this review, this section aims to extend this analysis, exploring Landow (1992) and Bolter's (1991) inflated claims for hypertext, particularly in relation to Roland Barthes' ideas of *readerly* and *writerly* texts and other post-structuralist notions of the relationship between the reader and the author. I will highlight critiques of this approach, made by, among others, Aarseth (1997) and Dovey, Giddings, Grant, Kelly, Lister (2003) and examine other approaches to the role of the reader (or *player* in some configurations) and the writer within digital literary systems and in pervasive games, in which the real and the virtual can become critically enmeshed.

¹⁹ *Augmented reality* games, also sometimes known as *pervasive games* and *mixed reality* games mix real-world locations with digital forms of play, drama and exploration.

The complex relationships between subjects and locations have also played a significant part in theoretical approaches to site-specific art. The art historian Miwon Kwon writes of such works as a focus for 'critical intervention' (Suderburg 2000: 43). Her writing resonates with many of the issues discussed throughout this review, not least of all in the analysis of works that recognise themselves as part of a relational phenomena, an 'unfixed *impermanence*, to be experienced as an unrepeatable and fleeting sensation' (43). Miwon Kwon (2004) uncovers the extent to which the notion of site-specificity is also embroiled with *Death of the Author* discourse and with questions of authenticity and the art-site. My own work is coupled to a specific location, (the South Bank area of South London), its structures, imagery and narrative references appear to be inseparable from the specific geography and history of the site, and yet, as Kwon shows, there are new paradigms of site specificity and mobility that challenge the very conception of unique and unrepeatable localities and the customarily literal spaces of art practice. My practice engages with notions of stability and place, self and text. It is a practice that seeks to displace boundaries and question categories through direct material encounters. The final part of this section will look at key texts and works relating to artist's books, showing how the lack of formally documented material has necessitated alternative research processes, including the instigation of online dialogue through Artist's book forums and Twitter sites.

Figure 10 following page, content generated by the *South* software



Is anyone there? If not where are they all? Has something happened. Are there any clues? Write a paragraph about this image in your log \$

Multi-linear texts

The hyperbole surrounding certain claims for hypertext and hypermedia as tantamount to an extension of the human mind (championed for example by Ted Nelson (1981), Jay David Bolter (1991), George Landow (1992) and Richard Grusin (1998)) can be linked to Marshall McLuhan's notion of technology as an extension 'of the human body'. These new paradigms, like other hypermedia structures, were frequently presented as a radical threat to the *oppressive authority* of linear and fixed forms of text, (so-called *readerly* texts) in which 'book-based knowledge systems' could be fruitfully replaced by 'network knowledge systems' (Dovey, Giddings, Grant, Kelly, Lister 2003: 27) or *writerly* texts, that are posited by Barthes (1977) as making readers into writers. In 1991 Jay David Bolter wrote of electronic writing that it would restore 'a theatrical innocence to the making of literary texts, electronic writing will require a simpler, more positive literary theory' (Bolter 1991: 147). Other writers, such as George Landow (1992), claimed ingenuously that hypertext fictions were in sync with post-structuralist notions of reader agency, which emphasise the supremacy of readers in bringing meaning to texts. But these claims, states Aarseth, are, 'confusing two different levels' (Aarseth 1997: 83) and represent a 'misalignment of the reader response (phenomenological) and the poststructuralist (semiological) concepts of text with the philological (material) concept of hypertext' (83).

Aarseth is rigorous in his critique of previous theoretical arguments that have created false dichotomies between analogue and digital texts. Aarseth offers a detailed repudiation of Jay David Bolter's (1989), George Landow's (1992), and Stuart Moulthrop's (1989) assertions about the theoretical significance of hypertext, in which hypertext is posited somehow as embodying post-structuralist 'conceptions of text' (58). According to Aarseth certain aspects of technological shifts, such as the transition from records, to tapes to CDs are superficially significant (59). A meaningful difference between digital and analogue texts however, is the issue of instability. The issue of textual instability is also raised by Lister et al (2003) who cite the fluidity of both the text and its interpretation as specific to interactive text. They connect this fluidity of both form and meaning to a sort of self-subverting threat to the 'canonical' status of written works.

Questions of instability, authorship and erasure are present in the context of my own mutable texts and computational writing practices. What happens to my signature as a writer in the context of a software environment that creates unforeseen changes to my texts? How is meaning constructed between my texts, my readers and the computational processes that mediate between these entities and myself? Is this even a useful way of looking at the texts that are generated by this collision of entities and agencies? New forms of disseminating and generating texts create both fluidities of interpretation and problems of coherence, Lister et al write:

Established methodologies for thinking about the way in which meaning is produced between readers and texts assumes a stability of the text...Under certain conditions of interactivity this traditional stability also becomes fluid.

(23).

Roland Barthes' essay *The Death of the Author* (1967) is firm in asserting that the contextual situation of the author plays no part in the reader's understanding of a text. But how does Roland Barthes' notion of the author relate to more recent notions of situatedness and locational epistemology?

The Author

Roland Barthes' key notion in *Death of the Author* is that the 'text's unity lies not in its origin but in its destination' (148). But is 'the true place of writing' reading (147) as Barthes assures us, or is the agency more distributed, to include many other factors, such as time, external events, the reader, or (if the work is digital) the computer and the author him or herself?

Barthes is right to emphasise the rise of the author as attendant to the rise of the enlightenment *Cogito*, or rational self, and right to challenge the presumed singularity of that self. But is Barthes right in his belief that the potent figure of the author can be neutralised, or indeed, wholly negated, in the reader-writer nexus? Is the negation of the author's role in meaning tantamount to a reduction of the author to the paradigm of a communication channel, an information-processing paradigm, in which, as Barthes put it, the author must 'die' in order to allow the reader to be born? In contrast to Barthes, (who largely excises the author from this meaning-making equation), reader-response theory envisions a virtual position that emerges from a symbiotic interaction between the reader and the text, rather than a process that eliminates the author completely. Wolfgang Iser writes of the reader- writer dyad:

if one loses sight of the relationship, one loses sight of the virtual work. Despite its uses, separate analysis would only be conclusive if the relationship were that of transmitter and receiver, for this would presuppose a common code, ensuring active communication since the message would only be travelling one way. In literary works, however, the message is transmitted in two ways, in that the reader "receives" it by composing it.

(Suleiman Crosman 1980: 107).

Of interest to my own research is the assertion by Wolfgang Iser that 'a text cannot adapt itself to each reader it comes into contact with' (109). Iser states this in order to support the differences between reading and forms of social interactions such as conversation:

The partners in dyadic interaction can ask each other questions in order to ascertain how far their images have bridged the gap of the inexperienceability of one another's experiences. The reader, however can never learn from the text how accurate or inaccurate are his views of it.

(109).

I believe this assertion is partially undermined by the responsive and discursive potential of computational works. Such works may be capable of responding to readers and of calculating a notion of interpretive 'accuracy'. Certain types of dynamic theatre writing, for example the *Theatre of The Oppressed*²⁰, and the works of a writer such as Martin Crimp, may similarly attempt to melt these supposedly twin poles, of authored aesthetic realisation and artistic interpretation by the reader. Crimp's play *Attempts on Her Life* (1997) is a case study in destabilising such boundaries. The plays of Martin Crimp's are striking for their mutable and relational constructions of identity and narrative. The titular *attempts on her life* consist perhaps, not of assassination attempts but attempts to decode or interpret a personality - that of the central 'character' Anne or Anya. This interpretation takes place within the context of a play that is essentially without characters. The task of interpretation is overtly distributed between the production (including the author) and the audience. There are no stage directions for the actors, and it may therefore be described as both open and indeterminate. The drama consists of an exploration of what the play might be about. This is strikingly reminiscent of the *I Ching* (a key reference for my own practice) and the Tarot, and serves as a constructive case study. Such an indeterminate and self-referential work is, I would venture, a difficult

²⁰ The Brazilian director Augusto Boal established the *Theatre of The Oppressed* in the 1950s and 1960s. His intention was to generate social transformation through an audience's active involvement and dialogue with dramatic works.

task to effectively negotiate, as such this is a valuable example of an engaging and (subjectively) successful experimental performance. The modular or in some senses algorithmic structure of the play is also reminiscent of interactive digital narratives but (in my opinion) markedly more engaging and complex than many digital works.

I would argue that *Attempts on Her Life* repudiates Iser's notion of the irreconcilable differences between writing and conversation, though in fairness Iser himself backtracks a little by stating that gaps in understanding spur conversation in a similar way that gaps in understanding define the interaction between a reader and a text. Iser, not unreasonably, sees the responsive cues generated in social interactions as a crucial difference between the two forms of communication. However, I would ask how new forms and ways of experiencing text might take advantage of these distinctions, and return to the question that underpins much of my practice - what will a literature be like that attempts to deploy the asymmetric relationship between the reader and the text, (and indeed between a reader and a computer) as opposed to a work that perpetuates Iser's 'fundamental asymmetry' (109) as problematic?

The notion of asymmetry in both textual and social interaction is central to Wolfgang Iser's construction of how conversation and communication are induced. But his interpretation is not entirely negative, and is perhaps closer to Barad's (2007) notion of *diffraction*:

Asymmetry and the "no-thing" are all different forms of an indeterminate, constitutive blank, which underlies all processes of interaction. With dyadic interaction, the imbalance is removed by the establishment of pragmatic connections resulting in an action, which is why the preconditions are always defined in relation to situations and common frames of reference. The imbalance between text and reader, however, is undefined, and it is this very indeterminacy that increases the variety of communication possible.

(Barad, 2007: 109 – 110).

My own interest in exploring the degree of symmetry or discourse possible between agents in a computational literary system is not motivated by the same goals of early hypertext writers and theorists. It seems that what hypertext theorists such as Jay David Bolter and George Landow were seeking was, as Bolter ingenuously proposed, a form of *innocence* or neutrality that is intrinsically unachievable. There is no such thing as a view from nowhere. The closest we can get to a view without perspective is the fragmentation of so-called *legendary psychasthenia*, as Grosz writes in (1994). It is a view that can form no perspective and cannot locate itself in time or space.

Grosz emphasises the notion of body image as intrinsic to our ability to create a 'distinction between the figure and the ground, or between central and peripheral actions. Relative to its environment, the body separates the subject's body from a background of forces' (Grosz 1994: 83). By stating this, Grosz is challenging Cartesian mind-body dualisms and placing the body at the centre of epistemological processes. But Grosz is keen to deny holism or transcendental notions of mind-body unity. Her approach is more complex, alluding to mind-body processes as a form of inter-constitutional entanglement, a Möbius strip of 'inscriptions and transformations' (vii). Elizabeth Grosz's work on the body re-conceptualises subjectivity and provides a framework for explaining subjectivity through corporeality rather than through binary notions of the conscious versus the unconscious. Likewise Grosz does not construe mind and body as opposites, but as two parts of a whole.

My work aims to place location, sensation and tactile response at the forefront of the site-oriented experience it offers to readers. Spatial fragmentation and psychic disorientation are also part of my site-specific narrative works, in which readers can find narrative threads through tactile experiences or lose themselves and find the work collapsing around them. The *South* project is committed to an investigation of alternative forms of knowing that are grounded in material practices, such as the generation of meaning through tactile experiences. Readers are invited to construct their own narrative interpretations through touch, sound and movement, to locate

themselves within and through the environment. The fictional protagonist of my work is an embryologist called Ivan Dâr. Ivan Dâr experiences a 'mental breakdown' in which he loses the ability to differentiate himself from his wider environment.

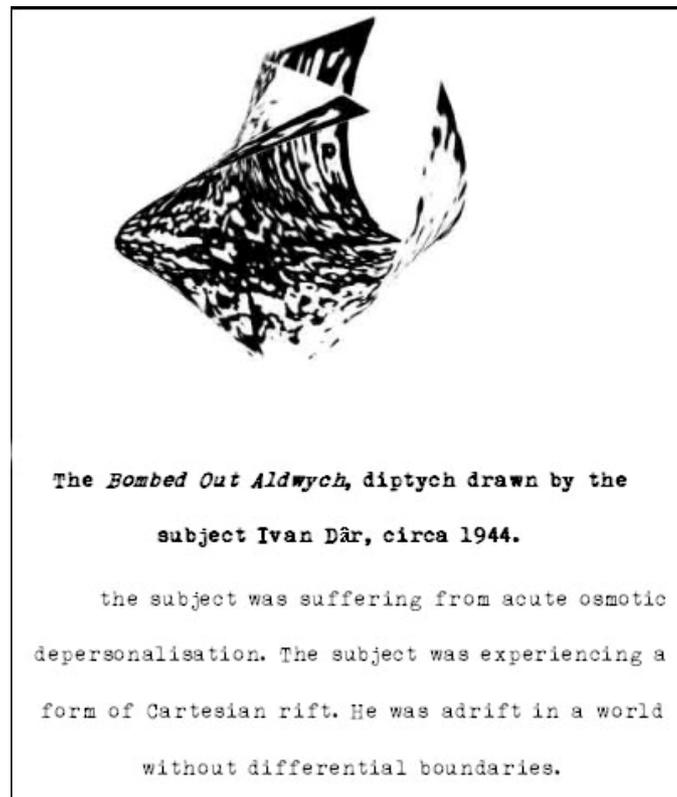


Figure 11 Above and below, pages from the *South* book depicting case-notes relating to the fictional character Ivan Dâr.



Readers of the *South* book and software writings are required to engage with the construction or representation of their own subjectivity. This construction is also enacted through sensory experiments as well as more traditional forms of psychological assessment. If readers attempt to ‘cheat’ or alter the system’s assessment of their personality *type*, then they are engaging in an unconcealed form of subjective performativity. This notion of performing ones identity has a degree of resonance with Judith Butler’s idea of gender as ‘a regulated system of performances’ (Mansfield, 2000: 77), but Butler’s statement that the body has ‘no ontological status apart from the various acts which constitute its reality’ (Butler, 1990: 136) is contentious and has been contested at length (see Kember, 2003), not least for the circularity of an argument that equates the total meaning of the body with discourse²¹.

Site-orientation

²¹ Butler herself attenuates this claim in (1993) *Bodies That Matter: On the Discursive limits of “Sex”*, Routledge.

This review has demonstrated how my work makes an explicit connection between subjectivity, epistemology and location, citing Grosz (1994) and Suchman (2005) as key theorists on the role of both embodied and environmentally situated knowledge production, but also describing the specific practices I have developed and through which I have generated alternative forms of knowing and narrative within the *South* system. I would now like to connect the centrality of corporeal and located knowledge production to the notion of site-specificity in my work.

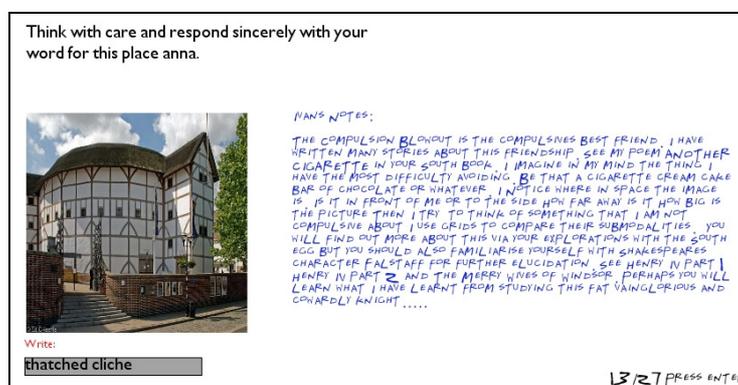


Figure 12 Above, a screen shot from the *South* evaluation software.

The notion of site-specificity shares some of the tensions implicit in conceptions of the subject and of the author. Miwon Kwon (2002) emphasises the problematic centrality of the author (synonymous with the artist in her terms) in contemporary site-oriented works. Kwon also suggests that a once radical form (variously known as *site-specific*, *site-oriented*, and *site-conscious* art) has been neutralised, ‘becoming insignificant or innocuous in recent years’ (Kwon, 2002: 2), largely through commodification and incorporation into the mainstream of arts institutions, but also because of limitations inherent in the form as it is currently perceived. Not least of the problems intrinsic to older notions of the site-specific is the instability of the site. Relatively recent conceptions such as virtual space, distributed networks and mobile technologies have challenged our ideas of the fixed location. Kwon writes ‘the very concept of site has become destabilised in the past three decades or more’ (2). This

is also the theme of 'ROAM: The Reader on The Aesthetics of Mobility' (Hoete (ed) 2004), in which new types of spaces and mobility are explored in light of these technologies and alternative notions of the site. One particular project 'Sites Pacific ®' by Albert Refiti and Anthony Hoete (2004) 'is founded upon the borderlessness of oceanic, rather than land-based exchange: "to be located in and around the Pacific is to confront the undifferentiated abyss that is the ocean". The ocean is the ground in Polynesia and has the ability to "rise up to decompose the face of identity"' (Hoete, 2004: 216). Refiti and Hoete's conception of *site* is challenging and non-literal, providing a valuable practice-based example of extending notions of site-specificity. My own conception of the South Bank site is also paradoxical and mutable. The site is present within my work as a series of both virtual and physical locations, but also as subjective, inter-subjective and situated formations, as complex sites of mutual constitution.

Miwon Kwon's description of the problems around defining site-specificity may also be re-framed (as I would argue they have been by Refiti and Hoete) as opportunities to re-formulate the notion of site-specificity within the context of new technologies and new notions of both agency and subjectivity. Miwon Kwon also warns of the hermetic dangers of works that overly focus on the author. Kwon expands upon the paradox of works that apparently negate the author but at the same time, and by doing so place the author at their centre. Kwon describes a form of site-specificity that is in fact a form of decontextualisation in the guise of historical re-contextualisation' (Kwon 2002: 49). Kwon interprets such works as an atavistic throw-back to modernist autonomy in the guise of post-modern mobility. These regressive works, Kwon asserts, also implicate a 'domestication of vanguard works by the dominant culture' (49), as previously described, a form of neutralisation by appropriation. Interestingly Kwon uses a specifically computational term to explain the paradoxical alienation from place of these works, describing them as 'object-oriented'. This term is resonant with the critiques of modularity in computational narratives made by Sengers (2004), and discussed earlier in this review. Kwon implies that certain types of site-specificity represent a 'fits all sizes' form of practice, creating a mere illusion of specificity.

Kwon's writing on site specificity establishes a rounded critique of site-specific works that incorporates many of the issues at the forefront of my own practice, not least of all the epistemological functions of the subject and the author. Kwon's warning against the 'hermetic implosion of (auto) biographical and myopic narcissism that is misrepresented as 'self-reflexivity' '(53) is both a stinging and valuable caveat that I have endeavoured to bear in mind throughout the development of this project. However, I would challenge Kwon's across-the-board problematisation of placing the author (or artist) at the forefront of such works. My presence within the *South* system is motivated by an intention to highlight the partiality of my own perspective (and practices) within the data and control structures of my software and to negate the notion of a 'view from nowhere', that would indeed represent a form of object-oriented de-contextualisation.

Pervasive games

Recent practices in site-specific art, theatre and gaming have coalesced into significant new forms. A number of so called *mixed reality*, *pervasive* or *ubiquitous* games have consolidated these diverse practices. *Can You See Me Now? By Blast Theory* (2001) is an example par excellence of the confluence between games, performance, site specific art and interactive narrative:

Tracked by satellites, Blast Theory's runners appear online next to your player. Situated in the real city, handheld computers showing the position of online players guide the runners in tracking you down. (Quote from website for Can You see me Now? Available at: <http://www.canyouseemenow.co.uk/belo/en/intro.php>

Accessed 27/12/08).

The stated intention of *Can You See Me Now?* is to explore the creative possibilities of locative media, to 'attempt to establish a cultural space on these devices'²². In

²² Quote available at <http://www.canyouseemenow.co.uk/v2/game.html> accessed 27/12/08

relation to *Blast Theory* and other mixed reality works, Richard Colson (2007) defines what he calls two schemas of mixed reality gaming:

In the first, aspects of real world action, dimensionality and finite spatiality are digitally captured and provide the source of raw data that is used to control corresponding elements within a simulated construct of reality. This is usually displayed on a screen.

In the second, mobile communication networks deliver real-time data to participants giving them the information necessary for navigating the real world and completing tasks that have been assigned to them.

(Colson, 2007: 124).

My work has points in common with both of these definitions. *South* captures data relating to a real-world space (the South Bank) and uses it (in conjunction with other factors) to define narrative themes and actions that will be enacted by readers, who might also be defined as *players*. Such works are defined by Jane McGonigal in (Von Borries, Walz, Böttger, 2007) as works that ‘augment everyday objects and physical environments with invisible and networked computing functionality’ (233). Examples of ubiquitous or pervasive games (also known as *Augmented Reality* or *Alternate Reality* games, among other titles) include *Can You See Me Now?* (Blast Theory: 2001) and more commercially motivated works such as the massive player game *I Love Bees* (42 Entertainment: 2004). The more challenging of these works such as *Can You See Me Now?* and *WHAVSM?* (Budzinski, Iserman: 2005) engage directly with issues of agency and reception, but Kwon asserts that their sometimes overblown emphasis upon ‘rich local information – maps, plans images and sounds’ (249) opens them up to the accusations of a spurious and schematised form of specificity.

It is striking that much of the writing about pervasive games and other innovative forms of game experience demonstrates a degree of hyperbole reminiscent of early writings around hypertext fiction. Lukas Feireiss for example, in Von Borries, Walz,

Böttger (2007), claims that computer generated worlds can dissolve linear and 'hierarchical order structures' (219). He insists that virtual worlds are somehow outside of socio-historical or any other 'external' influences. Players, according to Feireiss can be recruited 'beyond social, factual and time boundaries. At the same time, they make it possible for them to become master builders of their own virtual spaces' (221). My own practice is critical of such idealising statements, it involves the construction of exploratory narrative experiences that incorporate aspects of virtual and site-specific or 'real spaces'. In placing my own partiality of perspective as a central facet of these works I aim to generate a creative investigation into subjectivity and partiality within areas that frequently claim a form of transcendental neutrality. This notion of neutrality is too infrequently challenged or even explored within the context of interactive narrative and games, however, in using terms such as 'narrative' and 'game-play' I am aware that the work is entering into problematic territories. Such difficulties are outlined by, among others, Aarseth in (1997) and Frasca in (Perron et al, 2003), these points of contention, are, I would argue, an opportunity to generate an invigorating source of provocation and an instrumental counter-argument within my own practice. As the next section will show, the subject of artist's books, like that of narrative and games also encompasses areas of contention, a reading of the core works on this subject reveals problematic issues, not least of all in agreeing upon a definitive description of such works.



Figure 13 Above, drawings of the South Bank contained within the *South* book (E. Dare, 2009)

Artist's books

The *South* book exists within a historical tradition of artists producing their own books and also of artists sporadically involving themselves in self-publishing and of creating reproducible objects, sometimes known as Multiples²³. However, despite the tradition of artists working with the book form, Stefan Klima (1998) articulates a lack of consensus in the definition of what an artist's book is. This, as Klima notes, is also reflected in disagreements about the correct form that the words should take, between *artist's books*, and *artists' books* with the apostrophe, at the end, the itinerant punctuation is poetically indicative of an unsettled form. There is also a significant difference between the earlier *livre d'artiste* and what have become known as artist's books. *Livre d'artiste* were luxurious editions of books produced from the early twentieth century onwards and often designed and commissioned by art dealers such as Ambroise Vollard.

Johanna Drucker (1994) characterises the artist's book as a mid twentieth century form with distinctive characteristics, these are also acknowledged by Atwood and Phillpot (1976). The authors describe artist's books as marked by an engagement with the philosophical and material meaning of the book form, however, as my research indicates, there is very little documentation about artist's books and computation. N. Katherine Hayles' *Writing Machines* (2002) is a notable exception, this book investigates the possibilities that digital technology brings to the artist's book. *Writing Machines* writes positively about the medium specificity of Shelley Jackson's hypertext fiction *Patchwork Girl* (1995), it also contains a chapter on Talan Memmott's *From Lexia to Perplexia* (2000), a digital work that deploys computation to a significant degree, beyond using the computer as an image processing tool or as an inert vessel for a literalised remediation of the book form. Hayles' emphasis upon the materiality and embodiment of our engagement with diverse forms of book has been an essential reference and a vindication of the possibilities that computation has

²³ The word *Multiples* describes works of art that are made specifically to be repeated, the subject will be covered in greater length in Chapter four.

to offer the evolving form of the artist's book. Hayles also looks at the impact computation has had on popular analogue books such as Mark Z. Danielewski's *House of Leaves* (2000).

In contrast to *Writing Machines* Stefan Klima's *Artists Books, a Critical Survey of the Literature*, (1998) makes no reference to artists working with computation. A slim book, at 85 pages, it is significant and by no means exceptional among writing about book-arts that Klima makes no mention of the possibility of digital artist's books, instead the argument is made that all books will become artist's books or rather *book objects*, sculptural rarities in an age where most information will be disseminated digitally. Likewise, Johanna Drucker's *The Century of Artists' Books* (1995), probably the core text on artist's books (referred to by Stefan Klima in 1998 as the 'one monograph on the subject' (Klima, 9: 1998)), contains very little reference to digitally mediated works. Though the updated 2004 edition acknowledges the opportunities for wider dissemination presented by the internet, the book contains no images of digitally mediated books and no reference to any specific project or artist working with computation. At best computation is seen as a useful tool for printing books, disseminating information about book-arts or processing images, at worst it is seen as a potential threat to the book form²⁴. Though this omission is symptomatic of a significant lack of engagement with computational processes among many book artists, Drucker's book nevertheless provides a comprehensive background to the development of book-arts and to the emergence of the form as radical and socially engaged. *The Century of Artists' Books* is undoubtedly the definitive text on the subject and one of the major references in my own research. However, the lack of printed documentation about digitally mediated artist's books has been problematic, indeed Drucker and Klima both acknowledge that the form is generally under represented, Drucker writes 'it is remarkable how little comprehensive critical work has been done in the field of artist's books' (Drucker, 1998 (2004 reprint): xvii).

²⁴ This sense of threat is not limited to book artists, Sven Birkerts in *The Gutenberg Elegies* (1999) also characterises digitally mediated text as threatening to canonical forms of reading and writing. Birkerts writes, 'our educational systems are in decline; that our students are less and less able to read and comprehend their required texts, and that their aptitude scores have levelled off well below those of previous generations. Tag-line communication, called "bite-speak" by some, is destroying the last remnants of political discourse' (Birkerts, 1999) available here <http://archives.obs-us.com/obs/english/books/nn/bdbirk.htm> accessed 10/03/0.

Cornelia Lauf's and Clive Phillpot's (1999) *Artist/Author, Contemporary Artist's Books* is another impressive survey of artist's books that nonetheless fails to acknowledge digital forms beyond the production of images or as a putative threat to the future of the book. Clive Phillpot one of the co-authors of *Artist/Author* has been a significant and controversial figure within the sphere of artist's books, variously offering definitions of the form then renouncing or reviving them. Lucy Lippard (1977) has, like Phillpot, issued warnings against the reversion of the artist's book to its historically luxurious form, to the opulent and elitist *livre d'artiste*. Artists such as Larry Walzack (1979), Brad Freeman (1991) and Janet Zweig (1989) are among the many book artists highlighted by Johanna Drucker as eschewing the one off 'auratic', or rare art object, and instead engaging through the book form with social and political issues as an 'agent for social change as well as a site for intervention' (Drucker, 1995 (2004 edition): 307). Such works are of interest to me for being receptive to the possibility of books as situated and agential entities, inseparable from the environmental and temporal contexts they exist in.

The lack of formally documented material about artist's books and computation has necessitated the pursuit of alternative research processes, including the instigation of online discourse through artist's book forums including *Artists Books 3.0* and *Micro-Pages*. These research sources have yielded valuable dialogues about why artists do or do not use computation, in particular the book artists Sara Bowen and Abigail Thomas have provided extensive insights into their understanding of the book form.

I read books, make books, look at artist's books and make artist's books and in all of those activities the physical presence of the book object is important to me. I haven't thought deeply or in a scholarly way about what it is I feel I'm lacking when I encounter a book in the digital realm alone, but I do feel I'm lacking something. That physicality is really important to me, and I haven't yet encountered a work that exists purely in a digital format that has given me

something that makes me forget the lack of a physical presence.

(Sara Bowen, Micro-Pages forum, December 4th 2009, available at: <http://micropages.ning.com/> accessed 22/12/09).

Though engaged with computers both artists have expressed their ambivalence to the perceived loss of physical connection with books that the digital realm signifies. This emphasis upon the embodied nature of our relationship to books has been fundamental to my understanding and remediation of the book form. The *South* project seeks to establish a form of computation that is mindful, and indeed founded upon, alternatives to propositional, disembodied processes of knowledge generation. The technical section of this review will look in more detail at the epistemic foundations of artificial intelligence, providing a context for my development of a subjectively and environmentally situated work that has sought alternatives to the kind of knowledge generation epitomised by earlier digital narrative works, such as ROALD (Yazdani, 1982, 1983) and UNIVERSE (Michael Lebowitz ,1985).

Summary

The research I have undertaken in forming this review suggests that the notions of agency (particularly in relation to reading) propounded by post-structuralist and hypertext theories have been rigidly entrenched in narrow subject-object binaries and paradigms of cause and effect. It appears that, in particular, feminist theories of embodiment, agential realism and situated epistemology offer a viable and pragmatic alternative to historically entrenched approaches to reading and writing and interactive systems. Such traditional notions (even in the guise of radical theory) have been predicated on fixed notions of cause and effect which Suchman describes in (2005) as an 'enlightenment, humanist preoccupation with the individual actor living in a world of separate things' (Suchman 2005: 3). This preoccupation with the singular and fixed subject has not accommodated the relationality and situatedness of agency or, in Suchman's terms 'the always relational character of our capacities for action; the constructed nature of subjects and objects, resemblances and differences; and the corporeal grounds of knowing and action' (3). This emphasis upon

corporeality is central to Elizabeth Grosz (1994) and arguably offers a radical and viable alternative to Cartesian mind/body dualisms.

Within my own practice a central aim has been to construct a system that incorporates relational conceptions of agency and knowledge production. The *South* system attempts to interrogate the problematic dualisms enshrined in Western culture, such as those of mind and body, the subject and the object, the rational and the irrational. The system as such may be described as reflexive, situated and embodied. At the same time I take on board warnings from hypertext history and from writers such as Miwon Kwon, in particular the realisation that negotiating one's own subjectivity and authorship (without resorting to hermetic solipsism) is a complex and paradoxical undertaking. From the artist's book tradition I embrace a continuum of concern with the materiality and specificity of my mediums, I also draw upon the social engagement of book artists such as Janet Zweig (1989) and Joan Lyons (1989) whose work is committed to engaging with books, writers and readers as agents of change. The final section of this review will look in detail at the technical context of these methodological commitments, providing a comprehensive insight into the development of 'intelligent' narrative systems, software agents and technologies of personality assessment.

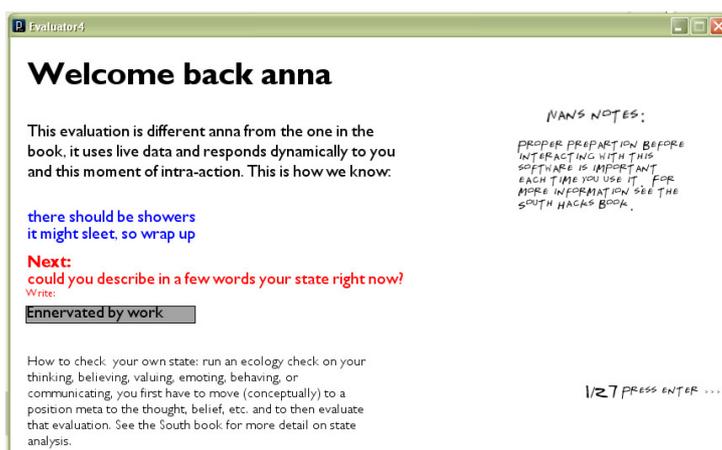


Figure 14 Above, a screen shot from the *South* evaluation software. The software uses web scraping to obtain a 'real time' evaluation of situating data, such as the weather at the time of interaction.

2.4: Technical review

Introduction

The purpose of this technical section of the literature review is to contextualise my technical references, explaining the links between my practice and my theoretical research and indicating the major issues that have arisen through that research. It will summarise what I have accepted and rejected from the technical material and how it relates to the theoretical and pragmatic aspects of the *South* project.

The materials I have reviewed in this section have much in common with the theoretical texts discussed so far. A major critical work that bridges both my practice and its theoretical contexts is Hubert L. Dreyfus's, *What Computers Still Can't Do, A Critique of Artificial Reason* (1972). Despite the fact that this book was written nearly forty years ago (its introduction has been updated a number of times) this is still a core critical text. Dreyfus presents a critique of computational models of mind that dominated early AI research (and arguably still have currency within some spheres), he is also critical of context-free, disembodied models of intelligence. Dreyfus's standpoint is shared by, among others Rodney Brooks (2002) and Lucy Suchman (1987, 2007). The works of Lucy Suchman are also cited throughout this thesis and have been cited extensively in the first section of this review. *Plans and Situated Actions: The Problem of Human-machine Communication* (1987), like Dreyfus's *What Computers Still Can't Do* is a coherent, convincing and invaluable critique of rigidly fixed rule-based systems. Suchman also emphasises the dynamic interplay of context, situation and the wider social agencies at play in human-computer interactions.

A book which has had less direct influence on my work but is nevertheless an important background reference is *Computers and Writing* (Holt et al, 1989). This

book is in some ways similar in purpose and structure to *Narrative Intelligence* (Sengers, Mateas: 2003), but it is concerned overwhelmingly with matters of technical construction and offers no substantial critical content. Despite that, the book does provide a solid grounding in the first computational narrative systems, which I have briefly outlined in the review where they are closest to my own goals (I have omitted systems that are interested in language analysis alone or systems constructed for aiding factual writing and report analysis). The work of Schank and Ableson in understanding narrative structures is still of immense significance within the history of artificial intelligence and writing. *Scripts, Plans, Goals and Understanding: an Inquiry into Human Knowledge Structures* (Schank and Ableson, 1977) has been a useful reference. My interest in this work is in taking its valuable insights into narrative structures and causal dependencies and incorporating them into more recent ideas around agency and intra-action. The other books I have reviewed here have provided both pragmatic and theoretical support in relation to the development of my thesis. This part of the review endeavours to explain that contribution and to situate my own work within a technical context.

At a glance the key names and projects in the earlier fields of computational narrative which have had most bearing on my own research are as follows: Schank and Ableson (1977), J.R. Meehan, inventor of TALESPIN (1981) and AESOP-FABLE GENERATOR, Natalie Dehn, creator of AUTHOR (ongoing?), Michael Lebowitz, UNIVERSE (1985), Colby and de Beaugrande, STORY-TELLING RULES (1976), Klein (1973, 1975), Rumelhart (1980), Propp (1968), Dreizin et al (1978) and Yazdani, creator of ROALD (1982, 1983). Sengers and Mateas also highlight many of these names as representing key historical figures and projects (Sengers, Mateas 2003). I would also like to mention a pre-digital work that has structural and theoretical significance to my thesis and practice. The *I Ching*, or *Book of Changes*, (edited by Confucius, 551-479 B.C.) is a divination system that treats events as processual and contingent. The mathematical structure of the *I Ching* (based on a biased random number generating system) influenced Gottfried Leibniz in the development of the binary numeral system. Its emphasis upon the mutable and relational nature of events pinpoints the *Book of Changes* as a significant reference for this thesis. The *Book of*

Changes also establishes a complex balance between authorship and interpretation that generates a uniquely situated new narrative.

This review has highlighted the centrality of notions of authorship in both my theoretical research and practice. These issues are also central to the development of many computational narrative systems, though they are not always overtly framed as such. In relation to ROALD and other similar projects, Masoud Yazdani wrote:

What these systems have in common is a disregard for the notion of "authorship". They aim to build an environment (instead of an algorithm) for creativity where new artifacts are created in a partnership between the Author and Reader (or User).

(Article undated, see Yazdani, M, *A New Theory of Authorship*).

Though Yazdani does pinpoint the primacy of the environment in generating intelligence, rather than a model of mind, this statement is very much in keeping with George Landow's and David J Bolter's conflation of hypertext systems with post-modern theory, (see section three of this review) particularly Roland Barthes' notion of the *Death of The Author*. Exploring the value or relevance of these ideas is one of the central themes of this thesis. My hope is that my research into subjectivity and epistemology makes an overt connection between these ideas, relating the idea that *Death of the Subject* discourse is entangled with *Death of the Author* discourse and that these ideas in turn have their routes in the so called *crisis of confidence*. In computing this crisis may be translated into a *crisis of representation*. In relation to my own work I would express this crisis in the following questions:

- How do we generate knowledge?
- How, (if we chose to), do we *represent* knowledge?
- Who and perhaps, *what*, is doing the knowing?
- How self-contained and stable is that knowledge and that knower?

Figure 14a PhD Journal entries 25th March and April 6th 2008, E. Dare.

Tuesday 25th of March 2008

Continuing with the Repertory Grid theme, with images anchored to my own highly contrived, totally scrambled yet more or less unitary sense of self, a self that is nevertheless subject to the mysterious effects of Hitchcock films and 'documentary' photography, ancient layers of psycho-ocular fluence... Despite reservations about the methodology (see March 10th 2008) in particular the cultural specificity and dualisms inherent in its seemingly positivist perspective blah blah, I'm thinking of ways to destabilize the materialist Cartesianism of the Repertory Grid, to allow for the 'errors' that the empiricist approach appears to dismiss, to restore the intelligibility of parapraxes, repressed motive, socio-historical forces. At the same time its hard to believe that Georges Polti's and Vladimir Propp's crypto-rationalist archetypes are really so universal anyway, and even more difficult to verify or repudiate, as one would have to read or listen to every story ever told, an exercise that would dwarf the adventures promulgated upon the reader by Italo Calvino in 'If on a Winter's Night a Traveler'. The autoblog (see 16th March 2008) is a start of course, hooked up a with a dozen or so promiscuous web bots it might eventually form a narrative singularity, a black hole of tales, the ultimate collapsing publishing house.

Sunday 6th April 2008

Snow hooray! Fitted a google image finding mechanism today (see top of page) , it takes words from this journal and then looks on the web for images to match them, I want to incorporate news feeds and other dynamically changing data into my writing system, to construct a distributed epistemology, a kind of standpoint software that evolves in response to ever changing events... this isnt emergence for the sake of emergence but an attempt to encompass a non unitary subjectivity in the generation of my own writing, the distribution of my own 'creative' agency, a type of self distribution, the open sourcing of my own subjectivity.

How rational and individual can we presume this knower and this knowledge to be?

Many contemporary computational narrative works are based on constructionist ideas of the rational subject, who is framed as a scientist/user. These ideas are central to evaluative techniques such as George Kelly's *repertory grid (or personal construct) system*, also discussed in this thesis. As section one of this review shows, these ideas have been coherently criticised by epistemologists such as Henriques and Hollway (see Henriques et al, 1984) as reinforcing unsupportable assumptions of neutrality and epistemological autonomy. These apparently irreconcilable standpoints represent key tensions in this thesis, and, I would argue in many contemporary computational works concerned with narrative generation. All of the works mentioned in this section of the review touch upon these issues as technical challenges, but as I indicate, do not always make overt connections with wider issues of representation and epistemological discourse.

Computers and Writing was written in 1989 in order to provide an overview of early attempts to use 'new' technology for writing applications. The book states in its introduction that the field of computational writing has found it difficult to establish a didactic focus due to the very breadth of its interdisciplinary concerns. Indeed the book represented an attempt to establish such a nationwide focal point and is connected to the first UK conference on *Computers and Writing*, this was part of the Communication and Information Research Group which, in 1988, belonged to what was then called Sheffield City Polytechnic. Many of the projects mentioned in the book, such as RUSKIN and WRITER'S ASSISTANT were concerned with creating technology to help people improve their writing skills. Though such projects had different end goals from my own project, they all asked key questions such as 'What is writing?' and 'How do we find out about it and model it accurately?' (Holt, Williams, 1989: x). With the advantage of hindsight I would observe that the book, particularly in its introduction, has an enthusiasm and hope for hypertext technology symptomatic of its time, and what we might perceive today as a naïve belief in the ever-improving possibilities of broader computational technologies. As I have suggested in the introduction to this section, it is in this sense uncritically

deterministic. My review of this book will focus on the projects and questions that are most relevant to my own research. TALE-SPIN and ROALD were two programs that attempted to generate stories. TALE-SPIN was created by J. R. Meehan (1981) and put into practice some of the ideas developed by Schank and Abelson throughout the 1970s. These ideas return to a model of human cognitive behaviour.

Masoud Yazdani describes five hypothetical processes that might be involved in a computational story generating system, these are: 'plot-maker, world-maker, simulator, narrator and text generator' (Holt, Williams 1989: 126). This model, Yazdani writes, 'simulates purposeful behaviour of characters as in TALE-SPIN, as well as interactions between the writer and the reader' (126). Yazdani also discusses the use of templates in generating stories, a notion explored by Roger Schank (1977). A template-based system is clearly limited (as all *a priori* structures are), but it is also a reflection of practices upheld by some analogue writers, who might also 'produce a new story by varying a known story' (Holt, Williams 1989: 126). The ability to reuse story structures, points, according to Yazdani, to the cognitive processes involved in comprehending stories. Yazdani assumes an essentially constructionist outlook in interpreting storytelling processes:

if people's memories are filled with detailed but nevertheless, flexible representations of past events and stories there is no reason to doubt that they would use some of these as the bases for generating new ones.

(127).

But is this outlook something we can take for granted? Part one of this review raises some of the points of tension implicit in these assumptions. Yazdani, like Holt, sees previous attempts to model story writing as too little engaged with the writing process, he cites Rumelhart's exhaustive story grammars featured in 'Notes on a Schema for Stories' (Rumelhart, 1975), which might, Yazdani suggests, be reversed 'from comprehension to generation' (Holt, Williams 1989: 127). Yazdani mentions a program created by S. Klein that identified such story writing structures in fairy tales and used them as a basis for computational reconstructions. Apparently this program

was able to generate '2100 word murder mysteries in less than 19 seconds' (128), but the process also involved rigidly prefabricated sequences. According to Rumelhart such structures are the basis for all human story-telling which can be abbreviated into the following six plots:

The Promethean striving for omnipotence.

Individual against society.

Polygonal patterns of libidinal relations.

War of the sexes.

Love triumphant or defeated.

The conquest of the flesh.

(128).

Van Dijk, Kintsch and Propp (1968) have also attempted to identify and classify story grammars to establish a structural 'relationship between these elements' (129). This represents a further simplification of the 36 'dramatic situations' identified by Goethe (among others) in the eighteenth century. The Russian formalists proposed detailed 'Rules of Expressiveness'. I would concur with Aarseth, however, in asking how relevant such models are to new forms of narrative generation. Is it useful to make a wholesale superimposition from the tradition of Aristotelian aesthetics to computational systems? As section two of this review states, this is one of the central questions of Aarseth's *Cybertexts*, it is also significantly explored in Perron et al (2003).

Meehan's TALE-SPIN approaches stories as essentially about the theme of problem solving, in symbiosis with a reader, the program generates a story about a problem and how it gets solved, the reader chooses 'the problem which the story is all about, out of a set of only four problems' (Holt, Williams 1989: 132). This approach has some similarities with my own initial model for a story-telling system, in which users could choose from a range of initialising events. But I do not see this as a particularly novel form of 'interactivity', a far more interesting approach for my own purposes is to allow situating and relational phenomena to define what theme will be generated.

Meehan's successor to TALE-SPIN, the AESOP-FABLE GENERATOR deployed a top-down approach, using template-filling to create a story structure such as 'Never trust flatterers' (133). Readers were asked to fill in certain aspects of the story such as who the characters were. Masoud Yazdani identifies this approach as a pragmatic synthesis of two models that have varying degrees of creative autonomy. Yazdani notes that the program is incapable of making accurate assessments of its own work and frequently eliminates stories that it perceives as 'wrong', when in fact they are more interesting variations on Aesop's fables. More complex variations on story telling rules might allow for the evolution of stories containing multiple characters, such a program would need to have a monitor, an agent that manipulates characters and their problems. De Beaugrande and Colby have identified plausible 'STORY-TELLING RULES' in pursuit of this goal²⁵.

Many of the questions which De Beaugrande and Colby have left unanswered, such as why choose one character over another, and, how one constructs a micro world, were subsequently addressed by Lebowitz and Natalie Dehn in their respective programs UNIVERSE and AUTHOR. Natalie Dehn attempted to incorporate the author's intentions into her program AUTHOR, (an ongoing work). Dehn writes 'a large part of the work of making up a story is the successive reformation of the author's goals' (Holt, Williams 1989: 136). Natalie Dehn uses a recursive method to loop through narrative goals, reformulating 'previously remembered stories' (136) and 'finding better narrative goals to pursue' (136). Yazdani describes this as a 'reverse fashion of remembering' (136.).

The presence or absence of the author in narrative generation systems appears to be a problematic issue. Without falling into the trap of *reading off* between domains, I would pinpoint complex similarities between the role of the author in computational

²⁵ Meehan, Colby and de Beaugrande were working on the development of systems driven by a model of writing that was essentially about characters solving problems and taking goal-directed actions, ROALD on the other hand represented an attempt to create a story-generating system that had its visual counterpart in Harold Cohen's AARON drawing program. Unlike the other programs mentioned in this chapter ROALD had both goal-driven aspects – its characters for example, and a separate monitoring module to assess the plans of those characters. Events were separated from the plot and loosely followed Aristotelian notions of a narrative arch while also having an awareness of previously constructed stories.

narrative systems and the role of the author or artist in site-specific works and in post-modern discourses around reading. In relation to site-specific art these issues have been clearly defined by Miwon Kwon in her essay *One Place After Another: Notes on Site Specificity* (Kwon, 2000). These issues meet head-on in my own work, which deals with site-specificity and subject specificity in the context of a computational narrative system. In a sense Lebowitz's UNIVERSE uses site and subject-specific structures established by Schank and Abelson to generate 'personal frame information for each character consisting of name, stereotypes, trait modifications, goals, interpersonal relationships, marriages and lists of events' (Holt, Williams 1989: 137) in the characters' past history. These personality stereotypes not only incorporate the numerical scales introduced in TALE-SPIN but also 'includes references to a set of built-in schema for professions.... social background... race....religion' (137). But it is the author who ultimately establishes the characters chosen in this hypothetical system. This is a system that has been deployed and proposed elsewhere, as Yazdani points out, he has proposed such a system himself (this system is also used by Natalie Dehn).

Within his own process-based model Yazdani differentiates and categorises the three systems, AESOP-FABLE GENERATOR, UNIVERSE and AUTHOR as simulator, plot-maker and world-maker (137). The notion of situatedness deployed by these systems is echoed by d'Inverno and Luck, (2004) and in d'Inverno, Luck, Ashri, (2004) in their writing about agents. A particularly potent conception of agents is as 'situated and embodied problem solvers that are capable of functioning effectively and efficiently in complex environments' (d'Inverno, Luck 2004: 3). The authors identify several definitions that illustrate the confusion and ambiguity surrounding the notion of agents and agency in computational terms:

a weak notion of agency is identified that involves autonomy or the ability to function without intervention, social ability by which agents interact with other agents, reactivity allowing agents to perceive and respond to a changing environment, and pro-activeness through which agents behave in a goal directed fashion. To some extent, these characteristics are broadly accepted by many as

representative of the key qualities that can be used to access 'agentness'.

(4).

A stronger notion of agency incorporates human conceptions such as 'belief, desire, intention, knowledge and so on' (4). In addition such agents would have temporal continuity, effective communication abilities that might constitute a type of personality, flexibility (in relation to the needs of users) and mobility across different systems. Autonomy may be further defined as goal-directedness, the ability to self-start, facilitated by sensitivity to their environment and the ability to choose when action is required. More complex qualities include 'veracity, benevolence and rationality' (4). My own interpretation of so called *deliberative* agents, or agents with beliefs, desires and intentions are central to the system I have developed. Within the *South* system multiple agents undertake the following tasks:

- Collect data from a range of web sources and analyse it.
- Generate weightings from situating data.
- Analyse and interpret the behaviour of readers.
- Maintain consistency of character behaviours.
- Analyse and interpret CCTV images and generate narratives as a result of that interpretation.
- Control the extent and range of vocabularies according to the height of the tide at London Bridge.

Multi-agent systems, defined as systems that contain 'a collection of two or more agents' (42), allow agents to generate a collective functionality. Such distributed agency is inherently more complex. d'Inverno and Luck define a formal framework for developing agents, in addition to describing how agents might make plans, interact and take action; the book explains agent notations such as the language Z, that are used to specify, develop and refine agent-based software systems. The authors also state that each researcher who refers to an autonomous agent should define their own meaning for the term (d'Inverno, Luck 2004: 3). I am reassured by the entreaty to define my own notion of an autonomous agent, and indeed, perhaps

to take a further step in providing my own interpretations of autonomy and alternative paradigms to those of cause and effect. My own agents do not use an agent language, but they can communicate the reasons for their behaviour. Jacques Ferber (1999) provides a useful chapter on communication, divided into three sub chapters entitled *Aspects of Communication*, *Speech Acts* and *Conversations*. The book points out that communication is a core ability for an effective agent, particularly in relation to its interactions and social organisation. Without the ability to communicate the agent is 'closed into its perception-deliberation-action loop' (Ferber 1989: 307). Ferber is keen to point out that communicated messages do not have an intrinsic meaning but are entirely situated: 'only the context is able to shed any light on the significance of modes of interaction' (310).

In pursuit of a system that can situate and differentiate subjects I have also undertaken research into statistical and psychometric processes. Segaran in (2007) offers a pragmatic exploration of statistical algorithms, exemplifying ways in which situating data can be analysed through orthodox statistical systems or more complex biological models, such as genetic programming for machine learning and the analysis of predominantly Internet-based data. Segaran also covers recommendation algorithms such as k-nearest neighbours (kNN) in which new data is compared to a pre-existing model and averaged to predict a new value, or recommendation. 'The k in k-nearest neighbours refers to how many of the top matches you use for averaging. For example, if you took three matches and averaged them, this would be kNN with k=3' (Segaran 2007: 293). Such deductions are made using distance metrics such as Pearson correlation, Tanimoto score and Euclidean distance. Straightforward distance metrics offer practical solutions to implementing some aspects of my own analytic processes. These may be distinct from or embedded into a multi-agent system. Long-term strategies might evolve from the storage and modification of successful models.

```

//scrape temperature from our weather data:
String weather[] = loadStrings("weather/weather.txt");
for (int ia=0; ia < weather.length; ia++) {
    println(weather[ia]);
    wether = weather[ia];
    String[] p = splitTokens(wether, "(");
    String tem = p[1];
    String ssl = tem.substring(0,2);

    int temper = Integer.parseInt(ssl);
    /*int temper = pre-processed temperature is now ready for analysis in
    evaluation4.java program */

```

Figure 15 Above, an algorithm from the *web-Gather* program in the *South* software. The code pre-processes a file of raw data obtained from the web via string manipulation. It extrapolates a ‘real-time’ temperature for the moment of interaction.

As well as analysing news, weather data and CCTV images, the *South* system also requires readers to engage with psychometric processes. Robert Edenborough (1994) presents a broad (and largely uncritical) introduction to the subject of psychometric testing that also provides a short historical overview of the area. This overview reinforces my perception of psychometric testing as an extension of other surveillant systems; this is explicitly suggested within the *South* system through the use of CCTV images and other control structures. Edenborough also provides practical information about the range, context, practice and interpretation of psychometric tests. Edenborough discusses different models for personality testing, from the *Gordon Personal Profile* that defines types of intra-human interactions, or tests predicated on other psychological models of personality such as the *Myers Briggs Type Indicator* (MBTI), a Jungian model of personality types. The *Edwards Preference Schedule* defines fifteen ‘needs’ that a person may be dominated by, such as a need for affirmation or a need for autonomy. All of the models can be reduced, (according to this book), to five essential dimensions of personality: extroversion, agreeableness, conscientiousness, neuroticism and intellect (Edenborough 1994: 38). Other tests may have 31, 15 or 16 essential scales. Edenborough also writes about *personal construct methods*. This process facilitates an individually-focused form of assessment based on a technique known as a ‘repertory grid’ testing, in which individuals progressively narrow their range of choices, such as choosing from lists of

people. Different categories of groupings are deduced in batches of three. The process goes through numerous iterations until 'all combinations are exhausted or no more types of combinations emerge' (148). The subject then ranks these constructs in terms of different definitions such as 'effectiveness' or 'importance'.

As the previous sections to this review indicate, these methodologies are not free from critical interpretation, not least of all by Henriques et al in (1984). The repertory grid process described by Edenborough has been used extensively, and I might add, critically within the *South* project. It is a process, states Edenborough, that is more effective than asking subjects 'simply to describe their perceptions of the world around them' (Edenborough 1994: 149), though Edenborough does not ask what is lost in contracting the process of subjective assessment to such a reductionist schema. Edenborough suggests the possibility of making comparisons across repertory grid outputs from a range of subjects, as a means for exploring individual as well as group value systems²⁶. The initial section of the *South* book consists of extensive repertory grid processes, but they are formulated as fiction-generating exercises and as invitations for readers to perform, invent or exaggerate their subjectivity.

Conclusion

This part of the review has sought to situate, analyse and reflect upon the key issues and figures relating to the technical aspects of my work. It has also attempted to explain the choices I have made in undertaking my research and to demonstrate how they relate to my practice, providing a rationale for my specific lines of technical enquiry. This review as a whole represents a critically evaluative appraisal of the materials I have drawn upon; it has attempted to clarify how my work fits into the larger context of digital literary systems, artist's books and interactive programs, as well as to theoretical questions relating to epistemology and agency. It has also shown how the research I have made into both subjectivity and intelligent narrative systems highlights the need for methods that accommodate situated and transparent structures. My aim has been to demonstrate that there is a significant lack of work

²⁶ Edenborough cites Bannister and Mair 1968.

that has pursued these goals and that there is a need to develop works that accommodate more challenging notions of subject-object boundaries and by extension human-computer interactions. I conclude that my own software should be predicated upon an open and comprehensible system of situated knowledge that includes an account of the authors' (i.e. my own) position within that system. Such a system also presents the opportunity to contest assumptions about narrative structures. This review has sought to demonstrate that a slavish adherence to conventional notions of narrative form has not necessarily yielded any significant creative breakthroughs within the field of computational writing. My aim has not been to produce or discover a definitive solution to these problems (this would be at odds with my own methodology), but to develop an arena for creative engagement with computers, artist's books and the generation of electronic literature.

In keeping with the diverse, non-singular readings emanating from *South* and its agents, my practice is underscored by a methodological breadth, and by a degree of ethical commitment to a multiplicity of perspective and practice. The next chapter will explain in detail the methodological scope that has supported *South*, establishing my theoretical frameworks and commitments while outlining the specific ways in which a non-passive and critical methodology has influenced the form of this project, both in its developmental processes and final outcomes (see page 122). The chapter will also show how I have engaged with a range of readers, or reader-researchers, pursuing an iterative process of evaluation and development, observing and interviewing real readers to gain an insight into the strengths and failings of the *South* system in order to establish a meaningful relationship between readers and electronic forms of narrative, deploying contemporary, networked and situated computation optimally, critically and creatively.

Chapter 3: Methodology.

Hacking *South*: a society of software explorers.

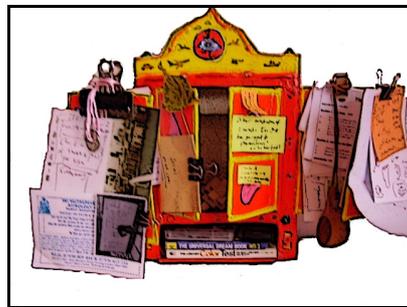


Figure 16 *Kavad for My Methodology*, acrylic and varnish on papier-mâché with assorted objects. The *kavad* I have made is a conceptual tool for refining, defining and articulating my methodology. E. Dare, 2009.

I'm grappling with this issue of theory not leading practice. I'm finding it difficult to grasp, the relationship seems entangled and I'm not quite sure what the rules are and why they exist, I suppose they are there to uphold the rationale for allowing practice to count as research, rather than an illustration of theories - the essential mistake of early claims around hypertext fiction.

(Eleanor Dare, research journal, 18/12/08)

In any practice-based PhD the researcher is required to generate new knowledge. In the hybrid zone between arts and computational technology there are meaningful differences between arts-based and scientific research. Recognising and accommodating these differences, as well as the significant points of convergence has been one of the central challenges for my PhD research project. As Graeme Sullivan states (2005), there is a need for artist researchers to generate 'different paradigms of theorizing' (Sullivan, 2005: xix).

There have been no ready-made recipes or *off the shelf* methodologies available to me. I have largely, therefore, had to invent my own strategies and systems in conducting my research. As a consequence, this chapter will outline the logic of my strategies, how I have designed and organised my work. Following Mason (2006) the 'significance, effectiveness and meaning' of my methodology and practices are reflected in my journals, field notes, and evaluations. These documents provide the means by which I record a 'feel' for the work I have undertaken while also providing data for analysis. They are flexible tools which help in the formulation and clarification of vital issues which might otherwise become lost. They enable a reflexive and temporally situated dialogue (both with the self and others) that unfolds over time. The research journal records the details of the process of problem formulation and the derivation of a research methodology and orderly reflection on the methods and techniques at the centre of my practice-based research. The quote from my research journal at the beginning of this chapter emphasises its importance in the shaping and orderly evaluation of my practice.

South is an arts project, or more specifically an arts and computationally based work. This brings its own particular qualities and challenges, such as how to represent non-verbal knowledge and how to evaluate it²⁷. This chapter engages with the strategies I have formulated in response to these challenges while also addressing the following questions:

²⁷ Jennifer Mason (2006) and Paul Carter (2004) have been valuable references in formulating my own arts-based methodology.

Figure 16a PhD Journal entry, March 4th 2008, E. Dare. Available at <http://www.dareinteractive.com/blog2.html>, accessed 07/04/2011. The research journal records the details of the process of problem formulation and the derivation of a research methodology and orderly reflection on the methods and techniques at the centre of my practice-based research.

Tuesday 4th March 2008

The 'genetic' algorithm I am working on is at least spitting out partially coherent sentences, which is quite an improvement on my normal writing style. It isn't going to be the hub of a text generation system though, it's operating on a sub-symbolic level, more suited to a tarot reading or the I Ching. The sentences are intriguing and meaningful to me, but other people might not agree. The text breeder is also recycling textual detritus - spam and blogs, feeding them into the software to get more ergodic results.

This month I've been reworking the PhD question, it seemed rather unsatisfying and lumpy throughout the first term. Now the question has got some solidity it can act like an anchor to stop the ship of ideas from capsizing due to overload. A more stolid question brings more detail and form to the literature review. The plan is to keep track of ideas, to observe how the work is 'progressing', ideas arrive which seem really useful but a couple of hours later they are often forgotten. I've been keeping a non-linear sort of journal, spread out across a network of tatty notebooks. None of it would make any sense to anyone else; I like to think of this as a strategy of fracture, a way of preserving immanence in my work. (only joking) There is no construction of consistency in this approach.

What is the methodology deployed in this PhD?

- What are the main issues that this methodology addresses?
- What are the main methodological issues in my field?
- What research tools have I constructed in undertaking my research?

The organisation of this chapter is as follows:

Section one provides an overview of my methodological approach and the philosophical assumptions underpinning my research. The section will also introduce my *kavad*, or *mobile-methodology-box*, a conceptual tool used by me as an alternative means for documenting my research methodologies using verbal and non-verbal forms, and alternative logic forms to those more commonly found in computational and scientific research practices. The *kavad* aids me in recounting a pragmatic and philosophical description of my PhD research, including a rationale for the unusually intense demands that the *South* project places upon its readers.

Section 2 will describe the conceptual significance of *the South* project's methodology, including specific techniques and interactions. The section will evidence some of the difficulties inherent in imposing notions such as *assessment* and *user evaluation* in relation to an arts project, it will show how *South* has utilised but also destabilised these concepts in the service of multiple interpretation, provocation and play.

3.1 Outlining the field: ontological and epistemic foundations for the *South* project

A 'standard' methodology would outline its ontological and epistemic foundations before proceeding to describe specific practices and a rationale for any analytical

deductions resulting from them. My research design adheres to aspects of such a schema, in that my core questions are clearly formulated. This design is supported by a statement of core issues relating to the field of electronic literature, human-computer-interaction and the broader domain of arts computing. It is further underpinned by a set of epistemic interests. Where this schema departs from an orthodox strategy is in its arts-based provenance²⁸. As an artist with a background in visual and sonic arts my epistemic interests represent a commitment to broader ways of knowing in all their multiplicity. This includes challenging GOFAI (Good, Old Fashioned AI) and positivist science in wider terms, such as propositional logic and the *a priori* knowledge bases of rigidly rule-based, disembodied systems. I acknowledge the importance of recognising that ontological foundations are fluid, contextual and consciously subjective. The following section will outline a brief ontology for *South*, or the putative essence and nature of my PhD practice.

***South's* ontology**

Figure 17 Below, ontological mapping for *South*, or the putative essence and nature of issues relating to this PhD:

The world cannot be represented through propositional logic alone.

Our knowledge of and experience of the world is embodied and includes knowledge that evades formal representation, such as *tacit* knowledge.

***Intra-activity* is posited as a relational, temporal and entangled locus of agency, offering a dynamic alternative to interactivity.**

²⁸ In explaining some of the essential features of arts-based research Graeme Sullivan, (2005) states:

What distinguishes arts-based research is the multiplicity of ways of encountering and representing experience, and the deployment of forms of expression that can effectively communicate these phenomena. This intersubjectivity and interactivity are seen as agents in research that are assets rather than liabilities. (Sullivan, 2005: 60)

***Intra-activity* is environmentally and subjectively situated.**

***Intra-activity* is a viable alternative to the rigidly rule-based systems, or *a priori* knowledge bases embedded in GOFAI.**

The difference between subjects and objects (including computers and humans) is contingent, emergent and unfixed.

Accounting for oneself in ones own epistemology is an ethical, and in Haraway's terms, a more rigorous scientific practice.

In conceptualising an ontology for the *South* project, it should be explicitly stated that such a reduction (or ontology) is clearly one of many possible ontological perspectives that could be theorised in this field. The value of forming an ontology has aided me in conceiving of a workable position from which to proceed with my research while overtly recognising that I have imposed an ontological perspective upon it, rather than coming at the subject with an idealised conception of my own neutrality. Identifying my ontological base has also informed the particular methodological tools I have deployed and in some cases originated. The diagram above is not merely a list of subjects relating to my PhD. Each statement represents a complex epistemic interest and, more importantly, a non-neutral position, or a set of well-researched value judgements. I have endeavoured to match my epistemic interests to appropriate and philosophically coherent research methods. I have opened the system up to more fluid processes of knowledge generation, and conceived of a system that invites its readers to *hack* into it. The ambivalent notion of 'hacking' into *South* will be explained in more detail in section two of this chapter and in chapter four, the *South* book chapter.

The data I have generated during this PhD has been analysed in a way that is consistent with its epistemological interests, especially in pursuing a reflexive and contextualised reading while acknowledging the problems that are inherent in any system of knowing, in particular the potentially circular systems inherent in the notion of reflexivity and in self-regulating digital systems. Computers, unlike traditional book forms, can dynamically change their content, what is more, by creating learning algorithms, computational fiction systems can potentially observe their readers and adapt their content to suit them and to accommodate external factors, for example significant economic, meteorological or political activities. In suggesting that computers can understand or learn from human subjects, it is important to acknowledge the medium specificity of digital systems and epistemologies. In stating that computers might be able to understand human beings I am not implying an understanding that is symmetrical to inter-subjective knowledge. By asserting the asymmetries at play in HCI, the question of subjectivity is also raised - what do I mean by a subject, how stable is this entity and how can subjectivity be represented or stored within a computational system? My thesis question also suggests, via the word *intra-active*, a situated and dynamic form of inter (or *intra*) action that unfolds between or rather *within* the moment of connection between a range of actors, or agents, both human and non-human.

Once I had established a well-mapped foundation of ontological and epistemic interests, focused on a specific set of questions, I was in a reasonable position to proceed with my research. The next section shows how my research design relates to these questions and will also introduce the *kavad* – or mobile methodology box, as a means of interrogating my overarching research design and the way it relates to my methods and epistemology, before focusing upon specific research techniques and tools in section 2.

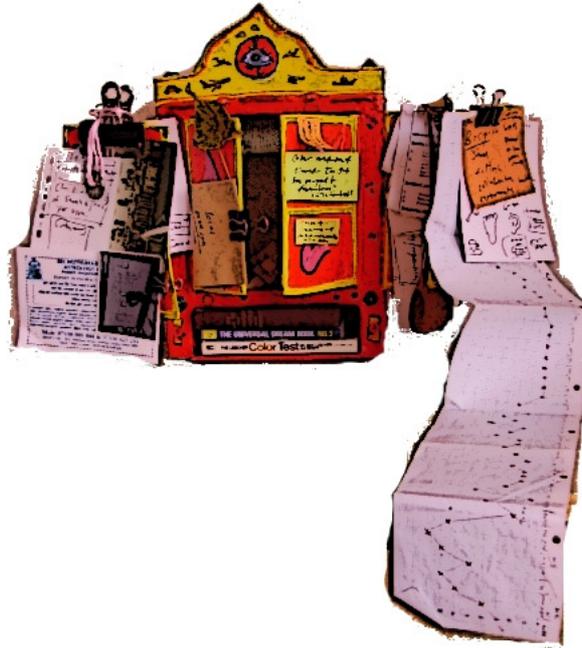


Figure 18 Above, the kavad. The long sheet of paper on the right is a longitudinal and quantitative mapping of my mood over several months. The data was fed into a software program called Subject Oriented Software.

Documenting methodologies: introducing the *Kavad*, or mobile-methodology-box

'It might act as a portal/filter to the streams of information coming in'

(Response from informant number 14 to a survey on the meaning of the *South egg*, 2009)

My methodology and its associated methods are grounded in the context of my research questions. Mason (2006) recommends that 'all qualitative research should be constructed around an intellectual puzzle of some kind, and should attempt to

produce some kind of explanation of that puzzle or an argument' (Mason, 2006: 18). In light of Mason's characterisation of research as a puzzle-solving activity, my research has been, according to her criteria, variously *developmental*, *mechanical*, *comparative* and *Causal/predictive*. (18)

Background to the *Kavad*: an unfolding box of puzzles

The *kavad*, as used in my research, is an experimental and conceptual form for documenting my PhD methodology via verbal and non-verbal means. It addresses my need to invent alternative research paradigms in order to more coherently match my specific epistemic interests, and commitments, to bespoke methodological tools and practices. I have used the *kavad* heuristically²⁹ to aid my understanding of my own research methodologies and their interrelationship to specific practices and conceptual issues.

My interest in the *kavad* form came from research into the development of story-telling technology. The *kavad*, *God-box*, *itinerant shrine* or *mobile temple*, is an ancient Indian (and broader Asian) mobile story-telling device. I have researched examples of *kavads* and *kavad*-like forms from India (Rajasthan) Bhutan and Tibet. *Kavads* are carried by itinerant story-tellers, or *bhopas*, (and by Monks in certain circumstances and locations) and are used as aids to religiously themed storytelling; the storytelling may involve audience participation, singing and dancing as well as talking. *Kavad*'s are wooden objects, about the size of a small rucksack. They are always brightly coloured (often predominantly in red) and furnished with multiple hinged doors that open outwards to reveal myriad layers of painted narratives. According to Macdonald (2000) *kavads* often contain slots to receive payment. There is also often a strict procedure for opening the *Kavad* doors and detailed symbolic codification of the colours used in the designs (such as red for the body and yellow for ornament). Behind the last, inner set of doors, there is traditionally a three-dimensional figure of a deity, as such the traditional Indian *kavad* is viewed as a sacred object. Macdonald (Macdonald, 2000: 4) links the *kavad* form to ancient storytelling practices that go back to the second century BC (BCE).

²⁹ In relation to the *kavad* the word *heuristically* is used to evoke an experience-based problem solving device.



Figure 19 Above, *Kavads* from Rajasthan. Below left, *Kavad*-like altar from Tibet, and right, a mobile Buddhist stupa from Bhutan, closed and open³⁰.



My use of the *kavad* form to document my methodology has been supported by the notion of the *kavad* as a technological, mobile, participatory, situated and processual device. With its many doors and possible interpretations, and, in the case of my own *kavad*, its many secret compartments, the *kavad* might be characterised as a type of *mechanical* or *causal* puzzle, but it is also a heuristic device that has helped me to understand the relationships between my thesis questions, my epistemological perspectives and appropriate means for generating and analysing relevant data. The *Kavad* I have made is the size of a rucksack with strong straps so that it can be carried on the back; it is constructed from papier maché sourced from London's local newspapers and is painted in red to signify embodiment.

³⁰ Image credits to http://hearstmuseum.berkeley.edu/exhibitions/rajasthan/portable_shrine.html

The *kavad* I have made has puzzle-like qualities in its own right, emphasising the layers of processes at play in developing a research methodology and the possibility of contradictions and tensions existing between different methods. The different categories of puzzle embedded in the *kavad*, relate to the puzzle-making aspects of my thesis research, they are as follows:

Developmental

A developmental research puzzle is concerned, as its name suggests, with an examination of how things have developed. In the case of *South* developmental research has been both theoretical and practical. I have dismantled and tested the code used in a number of other works, such as text adventures and hypertext structures in order to understand the logic and limitations of electronic literature. At the same time I have also researched the historical and contextual development of those same works. My *kavad* doors (of which there are four outer-doors and a further three inner-doors) loosely outline the direction of my developmental research through visual imagery. The images on the doors represent broad headings, enabling me to construct multiple narratives around the development of my practice, including relevant historical developments and the development of my own research. These narratives may be formal, involving examiners, supervisors and peers, or internal, enabling me to tell myself the story of my research in order to deconstruct and develop it. The illustration below shows the various doors, each illustrating types of knowledge. Propositional knowledge is represented by symbols from programming and logical mathematics while embodied knowledge is represented by pictures of human sense organs. Images of places such as the South Bank depict situated knowledge.



Above, *kavad*, acrylic and varnish on papier-mâché, E. Dare, 2009. The *kavad* has shoulder straps so it can be carried on the back like a rucksack.

Mechanical

In the context of my practice-based research the notion of a mechanical puzzle is linked in many ways to the developmental puzzle explained above. Mechanical puzzles are concerned with uncovering the mechanics of systems, whether epistemological or pragmatic, such as the computer systems mentioned in the previous section. Using the *kavad* to explore my methodologies necessitates a high degree of engagement with a mechanical puzzle – the *kavad* unfolds mechanically in the manner of a disassembly puzzle or the Japanese and Moroccan genre of *puzzle boxes*, while conceptually the unfoldings reveal a network of epistemological systems. When opening the first set of doors, curious people may discover that beneath the first layer of representations there are further layers of meaning that can be unfolded. These doors reveal some of the objects I have deployed in my research, including books and computers. The next layer reveals embodied tools for generating knowledge, while beneath that layer the curious will discover objects

(such as puzzles and maps) and further secret doors, some of which reveal voids, and others which reveal, for example, tiny keys and miniture books.

Comparative

A comparative puzzle involves comparing systems and epistemologies. The *South* project is a comparative puzzle par excellence, comparing computational and human epistemological systems, while also comparing analogue and digital books. These alternatives are also outlined via the *kavad*, which is itself an analogue form of mobile narrative technology in contrast to those aspects of the *South* system which model similar notions computationally. On the outer doors of the *kavad* there are visual representations of an ontology for *South*, these can be obscured or augmented by further artefacts, written texts, and non-verbal forms of data. The *kavad* can accommodate digital technology via a secret compartment for carrying mobile digital devices; this enables it to work discretely with capabilities such as GPS, thus attenuating the exaggerated polarisations that can be formed when making analytical comparisons.

Causal/predictive

My research takes a critical approach to the linear characterisation of many 'interactive' systems or linear models of cause and effect, hence my interest in researching alternatives such as intra-active, multi-linear systems of meaning-making. Having stated that, however, my rationale in constructing the *South* system has been based on identifying causal factors in the failings of electronic literature and in predicting the value of creating alternative, intra-active and situated systems. The *kavad* traditionally follows a particular type of causal logic in its narrative procedures, my *kavad* can work with the same, schematised and deterministic steps, but these may be confounded by void or closed cavities and by objects that resist straightforward explanations, such as a wooden puzzle and a tiny book of cut-up

Shakespeare plays. The *kavad* can also be used to take extempore narrative pathways and thus to elicit multiple interpretations of my methodology.

All of the puzzles outlined above have been matched to appropriate epistemological or knowledge generating systems, at the same time, there is a holistic sense of the puzzles creating what Mason calls a 'sensible whole' (19), or a reasonable degree of coherency and transparency. In addition to the requirement for reasonable consistency, or what I think of as a research *gestalt*, the research design, or response to these puzzles, has allowed for flexibility over time and the ability to ask additional questions as my research developed.

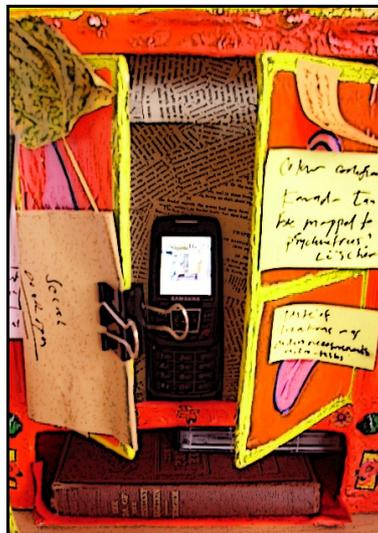


Figure 20 Above, the *kavad*. At the top there is a door that opens onto a secret compartment designed for hiding mobile phones, this enables the *kavad* to be tracked and to discretely trigger certain sounds as a mobile performance device.

The demands placed on readers

The *kavad's* historical relationship to a nomadic narrative practice and existential teaching is an important part of my choice in using it to document my methodology. The *South* project, as chapter four demonstrates, is exceptionally demanding of its readers, framing them as *existential explorers* and researchers, indeed, the use of the word *south* is an allusion to Antarctic exploration and the extremes of survival documented by Ernest Shackleton in his book *South: The "Endurance" Expedition* (2004). The egg motif featured throughout the *South* project (explained in chapter four) also has many meanings, but one of its foremost connotations within the *South* project, originates from Apsley Cherry-Garrard's book *The Worst Journey In The World* (1922), this gruelling book documents both the extreme efforts incurred to retrieve Emperor Penguin eggs from Cape Crozier (in the name of evolutionary research) and then to rescue Robert Falcon Scott and his three fellow explorers following their catastrophic attempt to reach the South pole between 1910-1913. Both books may be viewed as narratives of futility, especially in light of their proximity to the outbreak of World War I and their resonance with the end of the British Empire, but they may also be viewed as a testimony to human endurance and curiosity.

The *kavad* (and the *South* project as a whole) frames exploration as a metaphor for the research process, and in turn the research process is framed as a metaphor for exploration, both physical and existential. The fact that the *kavad* is carried on the back like a rucksack also has visual and physical resonance with the image of explorers and the physical hardships they experience. As chapter four of this thesis will clarify, the exercises generated by the *South* project emphasise physical endurance in their overarching theme of walking and seeking in the service of storytelling. At the same time, the many references to self-help culture within the *South* project also emphasise the commitment that readers are making to an intense process of self-examination and possible transformation, this is related in the *South*

book to the long term psychotherapeutic experiences of *South's* protagonist Ivan Dâr.

South is concerned with processes as much, if not more, than with teleological objectives. Having outlined some of the extreme practices readers are expected to follow, the next section will also discuss the specific methods and practices that I have followed and designed in linking my research questions to the generation of relevant new knowledge.

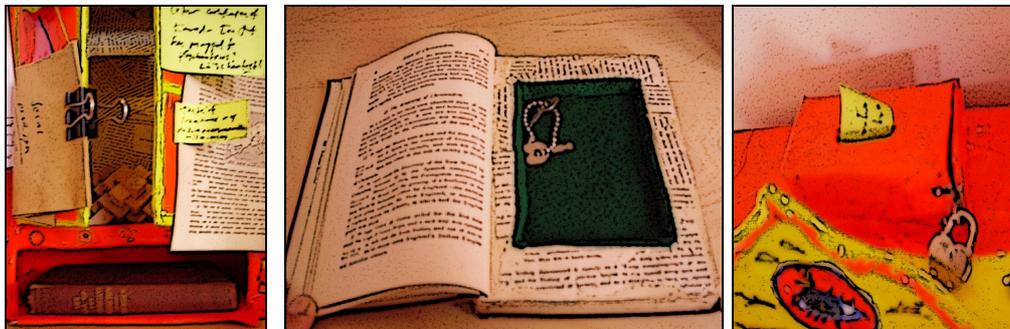


Figure 21 Above left, *kavad*, middle - detail of *kavad*, book with secret compartment, right - locked feedback/payment section of *kavad*, E. Dare, 2009.

3.2 Specific methods: mapping thesis questions to a coherent research design

Although I have tested many ‘solutions’ throughout the last three years, the greatest part of my PhD practice has been involved with finding or *inventing* answers to key questions, rather than testing out a set of ordinary solutions. Paul Carter (2004) suggests that the word ‘technique’ is used within the arts to hide what is institutionally and dogmatically unpalatable, which he unequivocally states is the notion of *invention*. Carter asserts the radicalism of associating research with both process and invention, he also points out the localised nature of discourse around

creative research and material thinking, again with the radical premise that the *localness* (for want of a better word) of creative research is at odds with the discovery of overarching or universal truths. These core departures from orthodox theories of research have great resonance with my own work and have informed the design of my research strategies.

‘What is my work for?’

A significant part of finding possible answers to my core questions has been the generation of appropriate practices, methods, or, indeed, creative *inventions* to generate the new knowledge that I have needed. The methods I have used and the research puzzles they are matched with are outlined below. Each method is related to a specific question and assessed for suitability, including a justification for using the method and an assessment of the pragmatic issues relating to it, and any ethical issues that might arise:

Text analysis: This is matched to the comparative, developmental and causal research puzzles mentioned in section 3 of this chapter. A great part, particularly of my initial research involved an examination of previous works and critiques of electronic literature as well as subjectivity, interactivity and agency. The data sources ranged from theoretical materials to digital fictions themselves, as well as blogs, journal articles, plays, novels and conference papers.

Psychometric tests: As part of my research into subjectivity I investigated a range of psychometric tests, this involved background reading but also taking a number of tests myself. Subjecting myself to psychometric tests generated insight into how I might deploy them computationally as well as in the *South* book, my experience of their many limitations lead to my s a critical response to them.

Quantitative subjective data: During the first wave of my research I wrote stories and embedded them in xml files (these are files that follow a structured set of rules in defining and laying out data) along with meta-data about my own moods,

thoughts and situating events. Some of this data included quantitative evaluations. The *South* software quantitatively tracks the mood of each reader as well as my own quantitative self-evaluations and evaluations of news events. The psychometric input of readers is also quantitatively assessed and compared to my own psychometric input, in order to obtain a Euclidean distance (the distance between two points) between a reader's evaluation and my own. These quantitative methods are used critically, with a view to each reader interpreting their validity for themselves.

Disassembling code: The disassembly or reverse engineering of code (where legal) was matched to the mechanical, developmental and causal puzzles outlined in this chapter. These processes, or disassembly puzzles, clearly relate to my main thesis questions, which are concerned with investigating ways in which computers might gain a subjective understanding of readers and situations. Code and structures that were deconstructed include text adventures, hypertext fictions, Weizenbaum's *Eliza*, aspects of Schank and Ableson's story-telling scripts and Marvin Minsky's frames as well as many other digital forms of fiction.

Generating new code: This relates to the mechanical, developmental, causal and comparative puzzles I have discussed. The generation of new code and programs has arguably been the most comprehensive and methodologically integrated aspect of my research. Generating new code relates to all of the questions I have outlined.

Writing: Of itself writing becomes a form of research and meaning-making, particularly in relation to my comparative puzzles around human and computational epistemologies and communications. Re-mediating my writing processes through computational systems has revealed a great deal about the fundamental differences between computers and humans. Trying to get computers to break down my own natural language input was initially frustrating, until I realised that the output the computers generated should be viewed as medium-specific, almost as a cultural artefact in its own right, and not an imitation of human sensibilities.

Friday 7th March 2008

A Double murder in Deptford:

If Lacan asked what humans would be without language, perhaps the question now is what would we be without data structures? In Britain this question was rapidly instantiated by the discovery of one greasy fingerprint on a paint shop cashbox following the murder in 1905 of Mr and Mrs Farrow at the Chapman's Oil and Paint shop on Deptford High Street. The brothers who committed this terrifying crime (also known as the *Mask Murders*) were the first British criminals to be hanged as a result of fingerprint evidence.

The execution of the Stratton brothers could be seen as the initializing event in a narrative of escalating taxonomic rapacity that includes the superimposition of other quantitative processes onto human experience, including intelligence and occupational testing, psychiatric evaluation, and more recently the transactional analysis of our banking, shopping, listening, looking, eating, shitting, talking, etc.

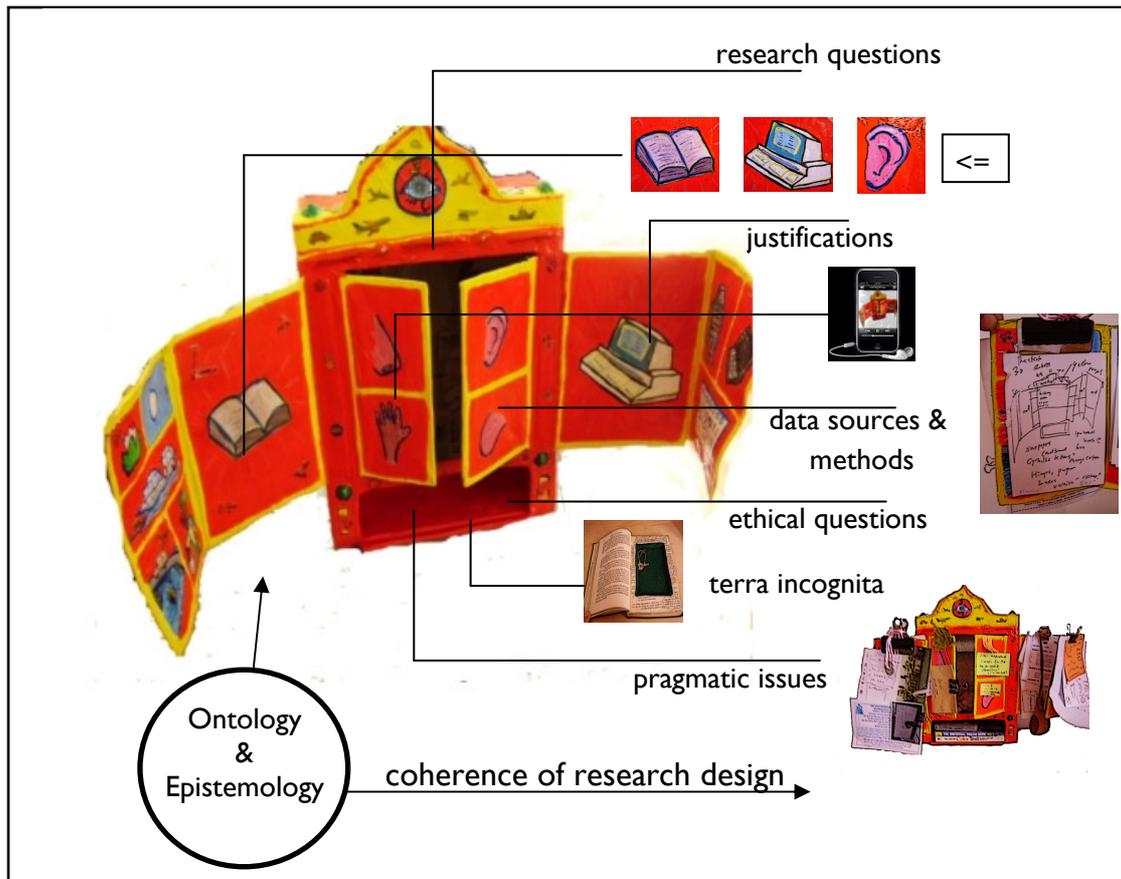
We might reinterpret this cheerless story of the Stratton brothers as death by the agency of both feckless human brutality and statistical analysis, but all this data, like language, represents us as subjects on behalf of divisive and deconstituting symbols, it constitutes our fractured subjectivity, the fact that there will never be a language, database or data structure big enough to make us fully understandable to anyone else; The data structures represent another despairing idiom, another human symptom.

Observation: I undertook longitudinal and intense observation of informants in the process of interacting with the *South* system (in both computational and book forms, but also, in one case, in the location of the South Bank itself). General observation of the South Bank area was also an important part of my research for the project, examining, for example, how people moved through the environment, what places they seemed to avoid, what parts of the South Bank were the noisiest or the calmest, and why this might be so. My observations were supported by drawings, photographs and by recording moving images with sound. I will explain these processes of observation in more detail in the section 3, as well as the following methods of reader evaluation:

- Depth interviews.
- Questionnaires and more creative forms of participatory writing.
- Participatory photography and drawing.

Using the *kavad* to assess my own processes

Figure 22 following page, the *kavad* as a mobile heuristic device, mapping questions to methods and aiding me to assess and communicate my research design.



I have used the *kavad* heuristically to map my research questions to possible methods, and to highlight issues of integration and conceptual coherence by forming an overview of my research design. Possible options are outlined throughout the *kavad* as reminders, primarily, that I should not dogmatically reject methods but consider their pragmatic as well as their theoretical feasibility. The *kavad* also provides documentation of possible data sources, including written, visual and sonic resources for knowledge generation. The *kavad* is made from news data, both local and national, in the form of papier-mâché, a happy symbiosis in light of my computational stress upon news data as a situating and dynamic form of input. In terms of its basic material composition the *kavad* may also be thought of as a fossilised form of news database, physically situating my PhD research in events that unfolded at the time of its formation.

Non-passive research design

I have emphasised a non-rigid and non-passive research design from the outset of my PhD practice. A non-passive research design reinforces the idea of research as an ongoing process. This process is supported by documentation, which I have undertaken in a number of different forms, such as:

An online PhD research journal: this journal reaches an unknown audience, potentially anyone with web access, but it is written for my own reflexive purposes. The journal features written as well as visual and sonic data.

'Private' diaries: written with no audience in mind other than myself, this degree of privacy enables me to express and explore really serious doubts about my work, or particularly unresolved ideas without the spectre of embarrassment or judgement by others.

The *Kavad*: is an experimental work in progress, and research 'tool' for documenting my methodology, it is designed primarily for my own heuristic use but will also be viewed by supervisors, examiners and peers.

Drawings: ranging from drawings for my own private use but also for seminars and web publication via my PhD journal. My drawings of the South Bank often involve drawing the same view or objects over many months, or even years. It is hard to articulate everything that I learn from making these drawings, but one aspect that I can articulate is the difference between my own drawings of a particular place and those of reader-researchers, and also the often significant differences and fluctuations in my own mark-making and fluidity over time. Epistemologically these changes can be related to my interest in subjectivity and mutability, computer vision and human vision.

Photographs: Serve the same purpose as my drawings but in my own practice are less reflexive and more instantaneous. The difference between my own photographs and those of reader-researchers is also a significant, if analytically elusive, data

source. I have also used CCTV images of the South Bank area extensively; these images are used to assess readers (they are asked to react to these images and to write descriptions of them) but also to generate narrative computationally via processes of image analysis.

Three dimensional models: The models I have made are both physical and computational; they have largely been used for my own research purposes, as aids to understanding locations, systems and stories.

Story telling via Street View: These stories were written under an algorithmic system of constraint, consisting of 100 words for each 'micro story', and a sample of pixels from the image that engendered the story, each image is 100 by 100 pixels in size. The writing of these stories was an exercise in observing the South Bank via digitally re-mediated space. The stories document changes in my perception of what a virtual South Bank signifies, from a perception of the images as straightforward representations, to an analysis of what they might cause to happen, in other words to a notion of their social significance and possible agency.

Sound files: some of my sound files have been published on the web, and others presented in seminars. These files consist primarily of unfolding narratives, but there is also some modelling of spatial resonances and field recordings of the South Bank. As in the case of my algorithmic storytelling it has been revealing to see how my use of sound files, (my perception of their purpose and meaning) has moved from the representational to the heuristic. More recent sound files have been deployed as heuristic tools in the evolution of narratives, rather than as narrative sources in their own right.

Moving images: are used for researching and documenting reader responses to the unfolding *South* project. These images may be shown to final examiners and used in seminars, but are primarily aids to my own understanding and tracking of the project.

Acknowledging the possibility of transformation within my research and documenting it via these methods has also supported the fluidity and development of my main research methods in all their forms. The next section will discuss the notion of assessing the ‘success’ of those methods and evaluating ‘user responses’,

3.3 Analysing and hacking: assessing the value of research data

In this section I will show I have evaluated the ‘success’ of these methods, explaining the rigorous and reflexive self-interrogation required to obtain and analyse data that is logical and consistent within the context of my overall research design. I have sought out complementary methods where possible, and in the case of my quantitative methods have deployed them as provocations, such as the ‘scoring’ of readers in comparison to my own psychometric ‘score’. This is clearly offered as a provocation to readers and is flagged up as such through the software ‘interface’ for the *South* project, in which highly subjective comments are made about the difference between myself and my readers³¹.

I have used reflexive and self-critical methods to support the generation of what I would argue are relevant and ‘trustworthy’ forms of knowledge. However, it is important to acknowledge the fact that the notion of trustworthy or ‘true’ knowledge is far from straightforward and that both quantitative and qualitative research methods are subject to extensive criticism.

Quality control

How then could I analyse the efficacy of my research in the context of a complex, multi-layered interdisciplinary project, which as I have stated throughout this thesis,

³¹ If the software identifies a significant quantitative difference between myself and a reader it might announce, ‘I hardly know how to talk to you, you seem like a complete stranger’ or ‘we have absolutely nothing in common you and I’. The system may also choose to give such readers a harder set of tasks or fewer materials, as evidence of its judgemental, inter-subjective stance.

cannot be represented or assessed under the aegis of a single-issue or a straightforward 'outcome'. *South* encompasses what Wilkie and Gaver et al (2008) describe as a 'heterogeneously composed' assemblage, an 'interweaving of practices' and technologies and, in the specific case of *South* different forms of knowledge and authorship. Wilkie and Gaver et al (2008) articulate the complexity of projects that are heterogeneously composed and not focused upon single outcomes³². How could I analyse the value of my data while accommodating what Wilkie and Gaver et al describe as the consideration of "logics' of interdisciplinarity beyond accountability and transfer and to avoid linear conceptualisations of innovation.?' (2)

The question of transfer, and the *transfer of intellectual property*, is particularly relevant in the context of the *South* project, which is supported by a high degree of participatory material and a high dependence upon situating data. I have made my interpretations or non-reactive, non-adversarial arguments as a result of the knowledge generated by my research, those arguments are presented in the form of computational and narrative systems as well as the more formal arguments presented in this thesis. The direction of my research has changed from its very earliest days, in which I was focused upon a far more static and linear notion of computer-human-interaction and had not yet formed a particularly nuanced notion of subjectivity and its role within a bespoke computational and narrative system. Over time my arguments have emerged in forms that are appropriate to the questions they answer. The methods I have generated match the types of puzzle they have addressed, as evidenced below:

³² Wilkie and Gaver explain how multiple outcomes allow us:

to appreciate and make legible a range of project forms, including not only simple collaborations producing easily articulated outcomes, but also the more sprawling, multidimensional collectives that produce a variety of seemingly less coordinated outcomes. The conjoint term creative assemblage attunes us to how creativity can be acknowledged as an effect of such assembling process rather than the residual capacities of an individual innovation author.

(Wilkie and Gaver et al, 2008:2).

Developmental arguments: My developmental arguments have been formed both theoretically, and computationally, through the *South* software, which has addressed the developmental problems and shortcomings, identified via my research into electronic literature and artist's books. Qualitative arguments, based on textual analysis and practice-based research into the development of electronic literature have entailed 'detailed, contextual and multilayered interpretation which is unlikely to simplify or caricature developmental processes' (Mason, 2006: 175). My core argument is that electronic fiction systems, like the earliest forms of Artificial Intelligence have been held back by top-down *a priori* structures and rigid rule bases that and have denied wider forms of knowing. These propositional forms of knowing have negated the contextual value of local situations, bodies, tacit knowledge and the subjectivity of program writers themselves; The *South* project is an argument for alternative structures and systemic relationships.

Comparative arguments: Likewise my comparative arguments have been supported by a similarly detailed and contextualised set of research processes. These processes have been based both upon textual analysis (with all the breadth of source material that this implies) and in the deconstruction of a wide range of electronic systems. Both methods are contextualised, 'local' and concerned with what systems and ideas *do*, (to people and to other systems), as much as *how* they work. In comparing notions of *inter* and *intra* activity as well as rigid *a priori* structures and flexible systems, particularly those proposed by Suchman (1987, 2006), I have presented theoretical and practice based arguments for dynamic, situated and less rigidly goal-oriented forms of intra-active narrative system.

Mechanical arguments: The mechanical arguments I have formulated have been theoretical but also situated and practice-based, necessitating intense processes of computational disassembly, testing and construction, while recognising the modes of interpretation that are always at play in making decisions and deductions about how mechanisms work. The situated nature of my programs and the ability of readers to access and change the core logical structures of that code through 'hacking' (see chapter four), is one of main responses and arguments; this argument has developed from the mechanical puzzles inherent in my main thesis question.

Causal/predictive arguments: The causal/predictive arguments operating within the *South* project are perhaps the most complex and the hardest to validate. My background research has led to a critical approach to the linear characterisation of many 'interactive' systems or linear models of cause and effect. This criticality has resulted in the adoption of alternative paradigms such as intra-activity and multi-linear systems of meaning-making. The computational and analogue systems I have generated aim to effect a relational, dynamic and situated network of causal/predictive arguments.

So far I have evaluated my own responses to my research data, but how could I evaluate the reaction of readers, or what I have come to describe as *reader-researchers* to the *South* project? The next section will look at alternatives to the singular interpretations of human-computer-interaction that have characterised and arguably restricted the design of many interactive systems, limiting them to notions of utility and a single authoritative interpretation.

Evaluating user experience

My home culture was based on Buddhism. The religion asks people to consider the relationship between themselves, nature and the world through self-questioning. However, these days many Koreans forget this great function of self-questioning in a rapidly changed society. So this small egg will be a reminder of how important self-query is in our lives.

(Informant 8, response to survey on the meaning of the *South* egg).

In writing about the evaluation of user experience I have found the work of Bill Gaver (2006), Gaver et al (1999, 2004, and 2008) and Sengers, (2006) particularly relevant. Evaluation within an arts context is an ambivalent and often neglected

concept (for example, it played no part in the teaching of my own degree in painting) and I have therefore drawn upon wider disciplines to investigate how I might evaluate my own work and the experience that it engenders in others. Gaver and Sengers (2006) frame evaluation within a methodological strategy, or logic of research generation, that is characterised by a commitment to multiplicity of interpretation. As this section (and also chapter four of this thesis) will show, part of the logic of my evaluation of readers and the solicitation of feedback from them, is to allow readers to ‘hack’ into the *South* software system and to reconstruct it according to their own epistemological perspectives.

As Sengers and Gaver (2006) observe, there are costly limitations inherent in judging user experience against the expectations of the artist, programmer or designer who has produced the system in question. As alternatives to single interpretation I show how the *South* system has solicited complex, multi-layered and often contradictory interpretations, characterising them not as problems in need of solutions, but as creative and welcome resources within the context of an arts computing-based project. Gaver and Sengers (2006) have outlined useful evaluation strategies that can accommodate multiple and complex interpretation of human-computer-interactions, in which ‘potentially competing interpretations can fruitfully co-exist’ (Gaver and Sengers, 2006: 1). They also document how ‘design and evaluation strategies shift when we abandon the presumption that a specific, authoritative interpretation of the systems we build is necessary, possible or desirable’ (1), stating that it is difficult ‘to conceive of interaction without interpretation’ (1). The multiple meanings that are assigned to computational systems by their users emphasise the importance of interpretation within HCI. Although the notion of single use and single interpretation may be appropriate in some cases, Sengers and Gaver point out that even in issues of road safety it is sometimes better to stimulate drivers and pedestrians into making their own, non-passive interpretations of safe behaviour, rather than telling them what to do.

In the case of *South* I am producing a system that is open to interpretation on many levels, from the interface itself, including buttons and colours, to the overarching significance of the entire system, summed up in the survey questions ‘what role can

it play in my life' (2) and 'what does it mean about me, my social group, my society, my culture'? (2). These questions, among others, are ones that I have asked a range of people in relation to aspects of the *South* project, confirming the assertion by Gaver and Sengers (2006) that multiple interpretations are almost inevitable in relation to computational systems. For a full description of the egg please refer back to the introduction to this thesis.

Figure 22a PhD Journal entry 21st October 2009, E. Dare.

21st October 2009

Revising my methodology chapter, my relationship to it has changed considerably since the first draft. The surveys I have undertaken have had a big impact on my relationship to the project, 'informant 8,' for example, wrote this:

My home culture was based on Buddhism. The religion asks people to consider the relationship between themselves, nature and the world through self-questioning. However, these days many Koreans forget this great function of self-questioning in a rapidly changed society. So this small egg will be a reminder of how important self-query is in our lives. (Informant 8, response to survey on the meaning of the South egg)

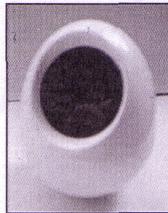
I want to re-evaluate the project interface, in terms of the software interface and the characterisation of the *South* experience, not being so reticent about it's framing of writing as a type of spiritual/self-exploration and performance, (of a processed based 'identity'). I'm building a detailed 'paper computer' to evaluate with a broader range of people. Opening the project to multiple interpretation (by others) has reminded me of some of my original intentions for the egg and the book, which were poetic and magical.. not so mechanistic

Figure 23 following page, an example of a questionnaire, the aim of the survey was to gain insight into interpretations of the egg's purpose. The egg was described to respondents.

Date 18/09/05 Consent to take part, (please sign): _____

Your answers will not be linked to your name; your name will not be used at any point in this research.

age 27	gender female	occupation student	Are you comfortable with technology? (tick beside Y or N below)	
			Y: <input checked="" type="checkbox"/>	N: <input type="checkbox"/>



Someone gives you an egg shaped object that seems to understand you. When you switch it on and take it to your favourite location, it starts to ask you quite deep questions. It also gives you suggestions for things to do, knowing somehow that you are, for example, shy or overconfident, it asks you to do exercises that give you insight into how you typically react to places and situations and other people.

You follow the exercises, the egg asks you to pretend to be various other people, again knowing how you work psychologically each task is really suited to you. It asks you very personal (but never embarrassing) questions, enquiring about things you might never have asked yourself before.

The egg also asks what you think about events that are happening in the world around you, such as what you feel about the news headlines that day or a famous person who's been involved in a scandal. It asks you to write and draw and smell things and imagine new ways of being you. It never seems to run out of ideas.

Questions for you:

What is it for?

It's your link to your conscience.
A god? An external force?

What role could it play in your life? It could help clear my thoughts, it would force me to act and think in different ways (with good or bad outcomes?)

If you used this egg what do you think it would mean about you? It would be an object of love or hate.

What would it mean about your social group? They might comment on the fact I have a strange relationship with an object...

And your society? It would direct some of the meaning & content of social interactions to the object or filter it through the egg. (If more people used it)

Or your culture? It would mean that we all need spiritual guidance and a kind of power exercised on us on a personal level.

Where would you like to use this egg? I would like to use it on a mountain or by the lake!

Within the context of the *South* project it has been more engaging and productive to allow for ambivalence and multiplicity of interpretation. With this ambivalence of purpose in mind, notions of utility are also challenged, and as, Gaver and Sengers state, 'alternative values, such as curiosity, play, exploration, and reflection are also important from this point of view' (3). Gaver and Sengers emphasise the importance of generating new strategies and methods for creating systems that embody these alternative values, such as 'purposely blocking' (4) and, thwarting 'any consistent interpretation' (4). This, Gaver and Sengers are at pains to point out is not the same as deliberately generating confusion at the level of usability, stating that 'what the system does and how it can be controlled is obvious – but the ultimate purpose meaning and usefulness of the device is left open for users to decide' (4).

In addition to the feedback forms illustrated above, other methods I have used to solicit feedback and user evaluation are:

- Usability testing (see appendix).
- Depth surveys (see appendix).
- Scenarios (see chapters four and six).
- Creative forms of participatory writing (see chapter four).
- Filming interactions.
- Participatory photography and drawing (see chapter four).
- Enabling readers to 'hack' the *South* software, changing its rules and logic at the level of code, as well as being able to change colours, narratives, types of situating news data, photographic references and embedded interpretations.

Examples and more detailed information about usability reviews, testing and interviews are documented in the appendix to this thesis. An additional level of user feedback is also solicited through the possibility of user based re-configuration or *hacking* of the *South* software described in more detail in chapter four.

The notion of usability testing, as Gaver and Sengers (2006) point out, is complicated by the notion of multiple interpretations³³. I have solicited multiple user interpretations through the evaluation processes listed above and through the invitation to re-write or *hack* my code and to expand the content of the *South* book. In this way I have used multiple interpretations to generate feedback cycles of interpretation and reinterpretation that uncover new ways of seeing my own work; these cycles also reveal some of my own unconscious projections and meanings in relation to the work. For example, respondents to the egg surveys (in which the egg was described and respondents were asked to speculate on its significance and purpose) told me variously that it was 'a substitute for a pet' (respondent 16), 'someone to discuss personal issues with' (respondent 6) and 'an alarm that awakens the subconscious' (respondent 17). All of these interpretations have given me fresh insight into my work and have revealed possible directions for it that I had not previously considered. The complexity involved in this approach has arguably been more suited to an arts-computing project than paradigms of unitary interpretation and idealised conceptions of impenetrable scientific objectivity. As the above section testifies, the *South* project requires a high degree of involvement from its readers. I would now like to assess and outline the ethical implications inherent in this degree of reader participation.

Research ethics and ethical knowledge generation

This section is relatively brief as I feel my measures for protecting user identity and privacy, while ensuring informed consent, have been sufficient to outweigh any potential problems, but in creating this section I am recognising the importance of

³³ Common approaches to evaluation in HCI are based on developing and testing against a priori evaluation criteria corresponding to the designers' anticipated interpretation of a system. But in taking multiple interpretations into account, systems can no longer be effectively evaluated in terms of criteria generated from a single, authoritative interpretation.

(Gaver and Sengers, 2006:7)

maintaining and emphasising an ethical practice at every level, from the epistemological to the inter-personal. This section is concerned specifically with inter-personal research ethics, outlining an ethically-based process of interacting with informants and their materials, however, the thesis and the *South* project as a whole are concerned with broader ethical questions relating to the way we generate, value and use knowledge and to the ways in which we frame the notion of a subject. Barad (2007) emphasises the ethical significance of agential realism, describing it as a conception 'with far-reaching consequences for grasping and attending to the political possibilities for change, the responsible practice of science, and the responsible education of scientists, among other important shifts' (Barad, 2007: 34). Likewise, Haraway has asserted that situated knowledge is a means to 'become answerable for what we learn how to see' (Haraway, 191: 190). Similarly my own PhD practice is embedded with an ethical commitment to situating knowledge and to a form of accountability that does not presume my own neutrality of perspective. The ethical methodology I have pursued has involved a critical engagement with the social and historical conditions of my own knowledge production. In this way I have sought to avoid what Liz Stanley describes as 'alienated knowledge' (Stanley, 1990: 3), an epistemology that assumes the God-like 'view from nowhere' Haraway so abhors (1991).

As stated above, the *South* project generates a high volume of material and activity from its readers, or *reader-researchers*. When users interact with the *South* software it generates tailor made instructions for them (discussed in detail in the next chapter). These instructions often lead to creative engagement by readers. This takes the form of writing, photography, drawing and physical actions. In addition to the material generated by *end-users* through their interactions with the *South* book and egg (which is an image viewing device in which the content generated by the software is viewed). The developmental stages of the project also involved

observation, interviews, questionnaires, photographs and filming, involving a range of informants, twenty-one in total. From the outset I have endeavoured to generate an ethical research design, both epistemologically, in the rigour of my research practice, (including not overriding the rights of others, practicing honestly and without plagiarism) and inter-personally - planning, framing and asking research questions as transparently and ethically as possible. It is important to state that putting the question of ethics at the end of this chapter is not the same as suggesting that ethical practice is an augmentation or an 'extra' part of my practice, it is fundamental to my research design, and applies to all aspects of it at every level; so what, one might ask does, an ethical methodology mean in practice?

Mason (2006) recognises the complexity of ethical issues, or even of defining what 'ethical' means. She recommends a pragmatic approach in which researchers ask what the purpose of their research is and how it might impact, for example, other individuals, institutions and research bodies. Following both Mason's recommendations and those of Payne and Payne (2005), writing on ethical practice, I have embedded the following core values and commitments into my research design:

- Informed consent is obtained from all informants.
- The identity of all informants is protected in all published material.
- Involvement can be withdrawn at any time, for any reason by any and all informants.
- My research is explained clearly and reasonably to all informants prior to their participation.
- Confidentiality of all informant materials is assured and maintained.
- No harm is done to any informant.

The practices these ethical commitments relate to are outlined below:

Visual methods

Mason (2006) raises the point that there are particular ethical issues connected to visual methods, foremost is the difficulty of gaining consent from all subjects captured in images. Where permission has not been obtained from subjects clearly appearing in participant and my own images, (and those images have been used in this thesis or the *South* book) I have blurred them. No research participants have been photographed without explicit consent from them to be filmed or photographed, and explicit consent has been obtained to use any images they have contributed.

Observation

No covert observation has taken place of informants; informed consent was obtained from subjects for all observations. Additionally, in a commitment to situating myself in my work, I have also tried to observe myself in the process of observation, noting where needed if I feel I lost track of events, missed something important or experienced any significant reactions within myself. These notes, as Payne and Payne recommends, are not documented as a stream of consciousness but are systematically organised (Payne and Payne, 2005: 169).

Depth interviewing

Face to face *depth interviews* were conducted with reader-researchers. My professional training as an interviewer emphasised the importance of not projecting my own opinions onto my informants, however, these interviews were *semi-structured*, with a core of key, pre-determined but open-ended questions which I freely probed. The notion of impartiality is contentious, as the questions I asked were defined by me, and also interpreted by me. These interviews initially involved note taking and then both note taking and photographic documentation. Informed consent was obtained from the informants to show these images to others as long as their names were changed. The informants were explicitly told they could withdraw from the research at any time and for any reason, fortunately this did not happen.

Participant writing

All informants and reader-researchers can request withdrawal of their material from new additions of the *South* book at any time, if that occurs the book will immediately be republished minus their contributions. This is made possible by the immediacy and flexibility of Publish-On-Demand technology. As in the case of visual methods, informed consent was obtained from all informants to use their materials, and all informants have had their identities protected. The results of psychometric processes engaged upon via the *South* software are not accessed by any third parties.

Questionnaires

All respondents were told about the purpose of the research and gave informed consent to take part. Respondents were left to fill in the questionnaires without any prompting by me, though I was near enough to answer any questions about the surveys when needed, but not to prompt, paraphrase or 'interpret' the survey for them. Instead I advised respondents when necessary to re-read the question and make their own interpretation of what it might mean for them.

Interview scripts and details of sample sizes and methods can be found in the appendix.

Conclusion

Throughout this chapter I have sought to demonstrate both the appropriateness and the conceptual significance of my methods, and to present arguments in support of the meaningfulness of my analysis and inferences without resorting to the idea that my data is non-neutral or somehow able to access an idealised and wholly objective set of truths. This chapter has discussed my *kavad*, or *mobile methodology box*, a heuristic device through which I have been able to examine and articulate my own methodological imperatives and design strategies. The *kavad* evidences an alternative

means by which an artist practitioner can reflexively research and assess their own practice, articulating aspects of that practice both verbally and non-verbally, through images, but also through materials, embodied actions and sensory experiences. These experiences and actions are explored through interaction with and analysis of my kavad, by opening its many doors, handling the objects contained within it and analysing the symbols and illustrations inscribed on its doors a range of methodologies and options are revealed.

In keeping with the rich notion of multiple interpretation that has underpinned my practice, and to emphasise the conceptual unity of this project, I would like to point out that the *South* egg, (the image viewing device through which the *South* content is accessed and displayed) is itself an inherently ambiguous object, with its circular causality ('what came first?') and its uncertain ontology (is it an object or a subject, an animal or a mineral, solid or liquid, inside or outside, fragile or strong?), the egg represents the possibility of multiple interpretation and non-reified ontologies. Additionally it is important to state that one of my meta-level goals (for want of a better articulation of *artistic intention*) has not been to create an immersive system, but rather its opposite, an anti-immersive system in which computational materialities are clearly at play, with non-invisible operations, as evidenced by *South Hacks*, a book embedded within the *South* book, for teaching readers how to 'hack into' and change the *South* software system (explained in more detail in the next chapter). This I should add is not an attempt to idealise this project or to give the impression of a Utopian system that operates without constraints, indeed the limitations of the system should also be accountable and non-invisible. The notion of hacking is itself parodied by the idea of an official guide to it³⁴.

A criticality of perspective is also maintained in relation to the idea of *user evaluation*. The use of methods such as participant photography and participatory drawing emphasise some of the illusory aspects of such evaluation, serving to outweigh the idealisations that can arise in notions of 'end-user' assessment. The photographs and drawings produced by readers are not easily analysed, a point made clearly by Gaver,

³⁴ A guide to hacking the *South* software is available online here:
<http://www.doc.gold.ac.uk/~ma501ed/south/Hacking%20south.pdf>

Dunne and Pacenti (1999) and Gaver and Boucher et al (2004). In relation to photographs, however, these materials do document aspects of user experience that cannot be obtained through talking or observing, charting the grey areas between 'what we say and what we mean' (Jørgensen, 2000). Within the *South* project these non-verbal types of participant material test the limits of representation in a similar manner to the way in which the limits of digital representation are interrogated via the computational aspects of the system. As the *South* system tries to understand users and readers via symbolic logic, it is also a test for human subjects to understand the efficacy of visual symbols. What, for example, does a reader mean when they photograph a concrete staircase as a representation of a 'male place', can such a meaning be blankly deconstructed? Such devices serve to remind researchers that there are limits to our knowledge and limits to our ability to represent what we, and others, know, particularly within the orthodox frameworks of scientific and objectivist epistemology. However, acknowledging these limits, as I hope I have demonstrated, is not a reason to reject the notion of definable and testable goals; rather it is a call to invent creative and insightful methodologies for accommodating complex and richly diverse practices.

The next chapter will explore my engagement with a computational artist's book, it will relate this conception to the other elements of the *South* project while elucidating the *South* book's theoretical and cultural contexts. The chapter will look at examples of other artists who work with both the concept and the materiality of the book form, expanding upon the historical provenance of such books touched upon in the literature review. Chapter four will also explore the relationship between my practice and my own historical and cultural background. An illustrated case study will show in detail the way in which readers can engage with the *South* book and egg.

Chapter 4: The South Book

Throughout the 'modern movement,' at least since the mid-nineteenth century, artists have published material both as an adjunct to their work at large and, at times, as its main practice.

(Cutts et al, 1986: 3).

South: A Psychometric Text Adventure, is an artist's book designed to be used in conjunction with the *South* software and egg, it is also designed to work with a physical location, the South Bank area of South London. This short chapter will look in detail at the way the *South* book is constructed and how it interacts with the other elements of the *South* project. The chapter will also explain the theoretical and cultural context of the *South* book, citing relevant examples of other artists who produce books and their historical/cultural provenance. Readers are urged to read both the *South* book and to watch the DVD submitted with this thesis (which is about the *South* project) before reading this chapter. The overall aim of this chapter

is to anchor the PhD thesis in the actual processes and artefacts engendered by my practice. It also contextualises the rationale for the *South* book, highlighting the relationship between my practice (concerned as it is with themes of agency and narrative) and my own historical and cultural provenance, in which wider social forces have played subtle yet formative roles, profoundly influencing the linguistic opportunities for two of my grandparents.

As my opening quote from Cutts et al attests, the *South* book exists within a historical continuum of artists producing their own books, sometimes also involving themselves in self-publishing, in order, for example, to establish a high degree of control over the production and dissemination of their textual works, and also of creating reproducible objects, frequently referred to as Multiples³⁵. *South* is connected to this practice but it also emanates from traditions of often marginalised forms of writing, such as:

- Self-help books
- Star signs
- Dream interpretations
- Populist psychometrics

These types of writing can all be characterised as *tailor-made* or interest-matching texts, they might also be described in George Landow's terms as *proto-hypertexts*, as textual versions of such books are often multi-linear and also frequently require readers to write in them and to undertake their own calculations to further the content. As such these texts could also qualify as *ergodic*, meeting the conditions defined by Aarseth (1997), in which the reader must work non-trivially to navigate a path through them. My motivation for creating the *South* book exists within the continuum of my practice as an artist engaged with writing and making books, and with an ongoing investigation into the meaningful strengths and characteristics that computation can bring to the experience of reading and writing.

³⁵ As the name suggests, *multiples* are notable for their lack of uniqueness, they are works of art made to be repeated, sometime mass produced. Multiples can be found-objects or purpose-made objects, they may be books, letters, sculptures or other types of 2 or 3D artefacts, examples of artists producing multiples include Ed Ruscha and Dieter Roth.

To augment this chapter a case study is presented, in which a real reader interacts with the *South* book and software.

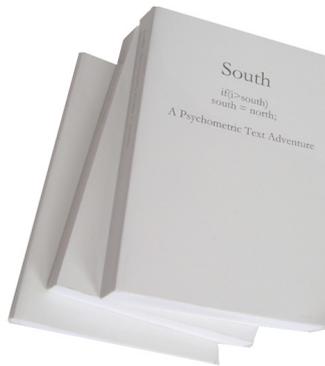


Figure 24 Above, the *South* book; it was produced iteratively, bearing some resemblance to the development of a computer program.

4.1: The book

The artist and theorist Roy Ascott calls the meeting of the digital with the human, including the embodied, the cultural and the mobile, ‘moist media’ (Alexenberg, 2008). This is an apposite term for my own work, dealing as it does with, not only the human, but the environmental, including the Thames tides and London’s weather patterns. The *South* book consists of evaluations, algorithms, additional exercises, stories, and some academic writing about the *South* Project. The book, egg and software engage in a series of exchanges, exchanges of agency and varying degrees of narrative congruence. Depending on specific interactions and situations the egg will also instruct readers to look for hidden content in the book, and to navigate new pathways through both the paper-based text and the physical location.

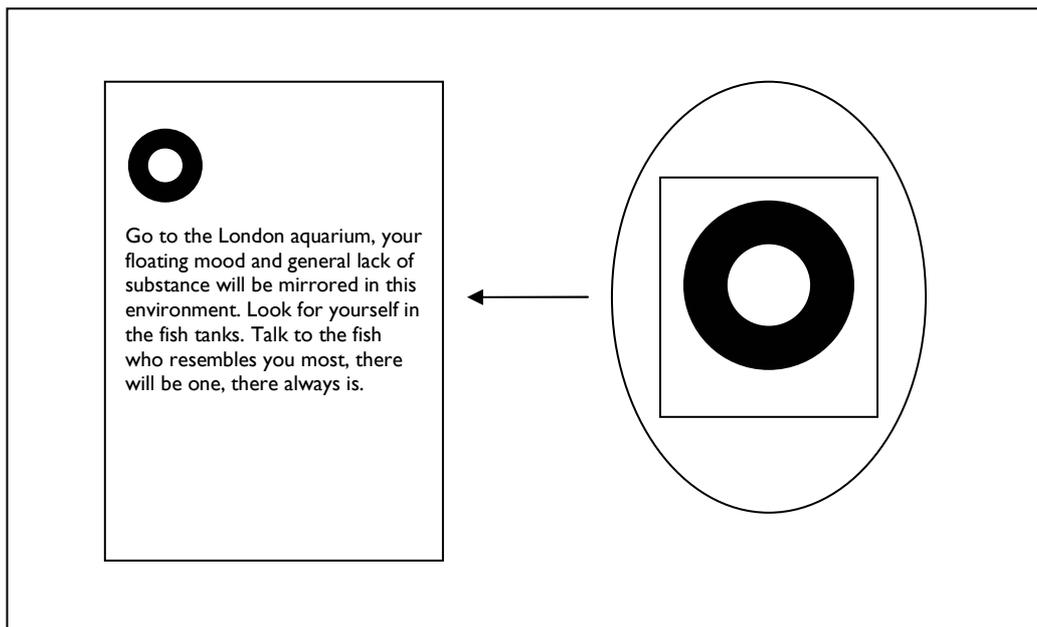


Figure 25 Above, the *South* egg instructs people to search out particular pages in the book as well as site-specific experiences conditional to their interaction with the software.

The *South* book assumes that its readers are intricate, intelligent and often inconsistent. The current form of the *South* book assumes a broad readership, ranging from people who are interested in London, walking and psycho-geography to those who are curious about what a location can tell them about themselves. Other readers may come to the book through their interest in game forms such as ‘Choose Your Own Adventure’ books and text adventures. All readers are required to engage in a series of psychometric (or psychologically evaluative) processes woven in and around the South Bank.

‘Psychometric’ Evaluations

A significant part of my practice has involved the construction of evaluative processes and procedures, both in analogue and digitally mediated forms. I have also researched the historical context of such evaluations and critical approaches to the

notion of personality assessment. The analysis of psychometric tests relates closely to my research into the notion of the subject, expanded upon in Chapter five. The notion of *psychometric* evaluations has its roots in the evaluation of intelligence (associated in particular with the nineteenth century eugenicist Sir Francis Galton) but later also evolved into the investigation and evaluation of ideas around personality traits or the notion of psychological types, such as ‘extroverts’ and ‘introverts’. My own interest in Psychometric tests stems from my childhood exposure to many forms of psychometric test designed by my Grandfather, who was an educational psychologist involved professionally (and ambivalently) in the psychometric evaluation of children. The procedures he designed were often tested on myself and my siblings and had the quality, at least in my own mind, of games, a connotation that I have clearly not abandoned over the years. The *South* software and book frames subjective evaluation as a form of mutable, multi-linear surveillance, fiction and performance, in the sense that readers are invited to physically act out the construction of different identities. This engagement with subjective evaluation is also intimately connected, within my work, to the notion of the site³⁶.

³⁶ Miwon Kwon's (2002) ideas about site specificity and identity have been particularly useful in supporting my interpretation of sites and subjectivities as relational and non-linear.

Below, structures at first selection

	1	2	3	4	5	6	7	8	9	
	Tower	Boat	Theatre	Egg	House	Sea-Shell	Museum	Pub	Bookshop	
Functional		✓	✓	✗						magical

In the left side column write what it is the two elements have in common. For example 'functional.' In the right hand column write down the way in which the remaining element differs from the other two, for example 'magical', 'entertaining'. It is for to you to discover these 'theories'.

Step 4: Complete all of the lines. Look at the theories you have constructed – including both of their poles, the primary and the emergent or contrasting pole. The result is a dichotomous arrangement for each construct. The emergent pole is in a strange position, and perhaps should be treated with a degree of epistemological caution, but for now it will serve our purpose.

Figure 26 Above and below, evaluative exercises in the *South* book.

Exercise Three:

Think

This process involves the cards marked == or *equal to*



Examine the images on the == cards. Go through the process as you have in the previous examples, with each turn select two images that have something in common, formulate a theory about why they are similar on the left hand side. On the right hand side explore the dissimilarity of the remaining card. Complete this procedure for the whole house.

Figure 27 following page, the subjectivity of *South's* readers is also framed as a complex form of location and, in conjunction with computational processes, an extended notion of an environment.

Inventory:

Before you depart it is crucial that you collect useful items to take with you, these items, if chosen well, **MAY SAVE YOUR LIFE**, so proceed with care.

Each of you should pick a word associated with the Southbank and the River Thames. It's a good idea to test this word out loud before finally committing to it. The sorts of words I have found useful in the past have been **BASTULE, RIVERINE, POWER-STATION, WATERLOO, SEA-CONTAINER** and **OXO**. These are purely subjective choices and may be wildly different from your own word preferences. Unfortunately there is only room for one word on this expedition. On the whole, the better the word the greater its relative atomic mass.

You will also need to choose a colour out of **RED, GREEN, VIOLET, BROWN, YELLOW, BLUE, GRAY** and **BLACK**.

South proposes a mutable form of both subjectivity and site specificity. The site in *South* is formulated by specific situations and corporeal sensations, the book therefore emphasises both situated and embodied interaction. Many of the evaluative procedures involve the senses, and indeed the progression of the evaluations through the five senses is part of the underlying narrative of the assessment process. The emphasis upon sensory and embodied interaction in both the *South* book and software also enforces the central notion that the technology we use does not exist in isolation from the cultural or physical spaces in which we live and work. The question of what constitutes knowledge or intelligence in these tests is also challenged (it is also an important question in the context of claims about intelligence and computing), what, the book asks, do we mean by intelligence? Are there other types of intelligence or knowledge that computers and conventional research processes can deploy? Such as:

- Embodied knowledge

- Tacit knowledge³⁷
- Situated knowledge

The processes presented in the *South* book and software are designed to facilitate an exploration of these questions within and through the South Bank location. My own subjectivity is also posited as a site or meta-location, resonating throughout every aspect of the *South* project. The book and software therefore aims to understand individual subjects and sites, but in order to work with these concepts I have had to investigate what the notion of a subject and subjective experience means. My research, (including lived experience) suggests that the notion of both the subjective and the subject is politically fraught and philosophically unstable; as such it is highly conducive to a critical artwork that capitalises on instability and contingency. The dynamic, mutable and networked nature of the subject framed by my research is highly suited to a computational form, and can, I suggest, support a meaningful use of computational strengths in relation to books, augmenting them with dynamic qualities that one could argue analogue books do not (literally) have. The notion of the site is also posited as a similarly complex configuration.

³⁷ Tacit knowledge is summed up by the scientist and philosopher Michael Polanyi in his statement "We know more than we can tell." (Polanyi, 2009: 4) Tacit knowledge implies a multi-layered background of subjective and unformalised skills and knowledge, including cultural and embodied forms of knowing.

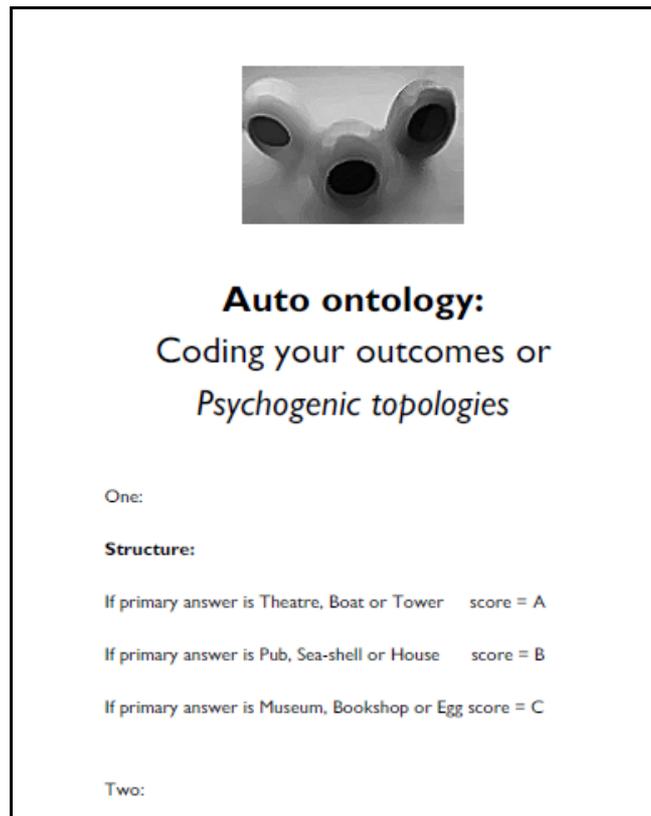


Figure 28 Above, the *South* book and software frames subjective evaluation as a form of mutable, multi-linear fiction and performance, but also as an extension of surveillant technologies.

By typifying readers into categories such as *Criks*, *Lerqs*, and *Ums* (the fictional types ‘discovered’ by my character Ivan Dâr) the *South* book aims to elicit a series of subjective experiences that challenge and negotiate the multiple and inherently contradictory ideas we hold about our own individuality and separateness. The aim is not to generate a definitive, new and final answer to these questions but to test out and reveal what Graeme Sullivan describes as ‘fuller dimensions of human processes and actions’ (Sullivan, 2005: 62).

Algorithms

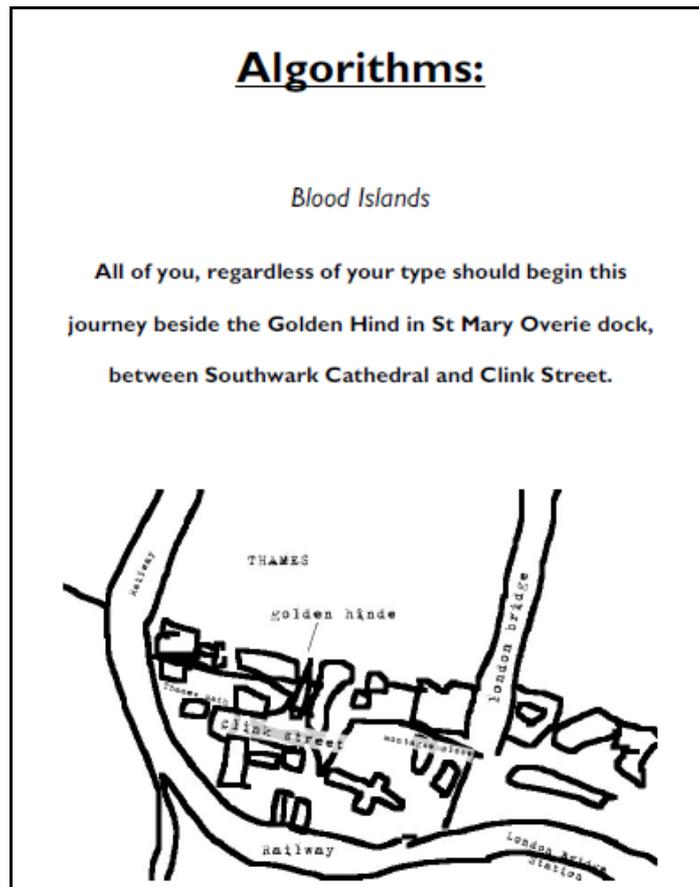


Figure 29 Above, the *South* book *algorithms* chapter.

Once readers have established the *type* they correspond to on any given day, they can then navigate through the exercises presented in the text as a series of *algorithms*. These algorithms form a sequence of subjective experiences generated by the reader's interaction with the *South* Book, they are offered as re-useable and evolving encounters, in which the environment itself functions as an extension of psychometric technology. The algorithmic processes draw upon a wide range of references including surrealist games, divination methodologies, the Theatre of The Oppressed³⁸, self-help and populist spiritual exercises, (of the type one might read about in magazines such as *Body+Soul*, *Experience Life* and *O, The Oprah Magazine*) including meditation exercises and visualisations and, as I shall explain, my own research practices. The activities also at times resemble the traditions of the flâneur

³⁸ The 'Theatre of the Oppressed' was a movement developed by the director Augusto Boal from the 1960s onwards, the central premise of the movement was to make political theatre in which the theatre became a force for social transformation with an active audience reframed as *spect-actors*.

and of *psycho geography*³⁹, in which the city is framed as a site of investigation into the inter-relationships between the urban environment and subjective experience, described by Guy Debord in 1955:

Psycho geography could set for itself the study of the precise laws and specific effects of the geographical environment, consciously organised or not, on the emotions and behaviour of individuals. The adjective *psycho geographical*, retaining a rather pleasing vagueness, can thus be applied to the findings arrived at by this type of investigation, to their influence on human feelings, and even more generally to any situation or conduct that seems to reflect the same spirit of discovery.

(Debord, 1955).

Research practices, or as Debord puts it, ‘a spirit of discovery’, are assembled around the South Bank, the *South* book and its software systems. In this configuration readers are not defined as co-authors, but rather as reader-researchers engaged in a discourse of localised and inter-subjective investigations. Paul Carter in (2004) explains at length both the difficulty and contingent radicalism of reframing research in these terms, writing that:

From the seventeenth century, at least, the guardians of knowledge and their political masters have stigmatised poetic wisdom as a rebel against reason. The rise of modern science encouraged a critical rationalism whose categories, general principles and facts have created an illusion of stability but are unable to explain ‘the reality of epistemic change’.

(Carter, 2004: 9).

³⁹ Psycho geography does not end with Debord, more recent exponents such as Ian Sinclair and Peter Ackroyd have focused upon London as a site of experimental exploration strategies, see Merlin Coverley’s book *Psycho geography*. (London: Pocket Essentials, 2006).

The processes generated by the *South* book are enmeshed with my own practices, which constitute a form of materially-based research, but they are at odds, as Carter observes of many arts practices, with conventional epistemic schemas that have separated knowledge from actions, senses and materials:

What should be said first is that the disciplinary separation that undermines an understanding of creative processes also inhibits the emergence, even locally, of a discourse coeval with those processes rather than parasitic on it, often offering nothing more than a rather pretentious post hoc rationalisation.

(Carter, 2004, 9).

In the complex formation represented by *South*, the knowledge generated by the reader in engaging with these algorithms is not separable from the processes that form that knowledge. Hence, the emphasis on re-formulating radically different experiences dependent on local and subjective conditions. The *South* book and its readers, like the volatile content of the Thames itself are inherently unstable and localised, at least in my conception of them. The interdependency of each algorithm, and its direct relationship to the subjective state of readers, enables the book to also at times deliberately limit the mobility of users, emphasising the idealisations as much as the realities at play in this work.

Only certain team members can undertake certain tasks. These specialities will become clear as the expedition unfolds. The number beside each explorer will have a direct impact on how well certain tasks will be dealt with. However it is unlikely that you will survive let alone complete this first journey. Luckily Ivan Dâr's non- Euclidean topologies allow for previously impossible repeats, refoldings and temporal-spatial recurrences.

Now go to page 88 >>>>

Figure 30 Above, a page from *South*. The *South* book also limits the mobility of readers dependent on their 'scores' and psychometric evaluations. In conjunction with the *South* software and egg, readers can also find their choices limited or expanded, depending on an ongoing assessment of overall responses.

In conjunction with the *South* software and egg, the book takes on an even greater degree of contingency, issuing instructions that have been generated in response to economic and meteorological events as well as my own subjective changes. It is significant that in this largely mutable configuration it is the overtly fictional content, the stories I have written about Ivan Dâr and his subjective disintegration that retain the greatest degree of stability. Ambiguity, tension and mystery, if they exist at all, emanate from the experiences readers generate for themselves in the materiality of their research into the site and their own subjectivity.

4.2: Treacherous blue books: *South* stories

It was clear that crossing the forest had cost each of us the power of speech.

(Calvino, 1977: 4).

Woven into the algorithmic procedures embedded in the *South* book are a series of fictional narratives, these narratives and meta-narratives enjoy varying degrees of convergence with reader experiences and with the narratives readers themselves enact through their exploration of and response to the South Bank. The protagonist of my own fictions is a character called Ivan Dâr; his story articulates questions of authenticity, separability, normalcy and 'natural' language. These questions are

embedded within my own cultural and socio-historical background. My grandmother, who was profoundly deaf did not learn sign language but instead attempted to lip-read (with, as I remember it, little success). This may be viewed within a wider historical context in which ‘oralism’ (the use of spoken language) was emphasised over the use of sign-languages, not least for its normalising significance in relation to the majority hearing community. In Van Cleve (1999) Anne T. Quartararo’s chapter on deaf identity and French republicanism succinctly expresses the relationship between language and ‘civilisation’, and the motivation for making the deaf speak like the hearing as opposed to using manual sign languages:

The goal was to make deaf people more “human”, or, like the rustic peasant forced to learn correct French, make deaf people more “civilized” through the use of the “spoken” word.

(Quartararo in Van Cleve, 1999: 45).

In 1880 the *Second International Congress on Education of the Deaf* was held in Milan. The congress infamously ruled that oral education should prevail over sign language. This resulted in the widespread promotion of oralism (including lip-reading) over manual languages, arguably motivated by a strong desire to make deaf people appear ‘normal’. While I do not wish to portray my grandmother as a victim of these policies, I think it is arguable that the normalising sensibility underpinning these rulings did have an agential role in her ability to communicate and by extension to many wider aspects of her life.

In a different, though not unconnected form, my paternal grandfather also experienced constraints upon his language. Although he was born and brought up in South Wales (like my grandmother, in the early twentieth century), he was not allowed to speak Welsh. This fact exists within the wider historical context of Welsh language suppression which reached its apotheosis in the so-called ‘Welsh-not’. The Welsh-Not was a wooden block that children were forced to wear as a punishment if they were caught speaking Welsh at school. The denigration of the Welsh language was supported by the infamous ‘Treachery of the Blue Books’ (Brad y Llyfrau

Gleision), an influential report into the state of education in Wales commissioned in 1846 and presented in 1847. The report enforced a notion of Welsh culture as inferior and the speaking of Welsh as educationally and socially detrimental. In my grandfather's case it was his own Welsh mother who enforced the prohibition, based on the idea that the Welsh language was 'common' and a language for peasants, an idea that had been widely reinforced and apparently absorbed by many Welsh people as a result of the 1847 report. In light of the fact that some of my grandfather's relatives on the Island of Anglesey (Ynys Môn) were reputedly monoglot Welsh speakers, the prohibition could be interpreted as effectively severing him from those family relationships.

!Welsh



Figure 31 above, the 'Welsh Not', worn as a punishment by Welsh children if they spoke Welsh at school. The *Welsh Not* illustrated above can be purchased as a gift from the site [welshhistorystories.com](http://www.welshhistorystories.com), adding one might argue another layer to the wider narrative of the Welsh language.

<http://www.welshhistorystories.com/artefacts.html>

The fictional protagonist of *South*, Ivan Dâr, experiences a breakdown in which he can no longer speak his own language but instead reverts to a broken form of Russian, this echoes the fact that, in addition to the restrictions imposed upon my grandfather's childhood mode of speech, in the early 1930s in London my grandfather experienced a twelve month psychosomatic 'breakdown' in which he could not speak at all. This inability to speak is framed within my re-telling as a silent articulation of some of the tensions inherent in the hierarchies of value faced by migrant and colonised communities in relation to their 'mother tongue', even

(perhaps especially) if their own mothers collude in its suppression. Ivan Dâr experiences an even more bewildering lack of groundedness, loosely based on a condition known as 'legendary psychasthenia', in which people cannot locate themselves, or differentiate themselves in relation to the wider world, which one might conceptualise as the environment beyond the boundaries of their own skin. Roger Caillois in 1935 described this condition as one in which space becomes an annihilating agency acting against subjects:

Space pursues them, encircles them, digests them in a gigantic phagocytosis. It ends by replacing them. Then the body separates itself from thought, the individual breaks the boundary of his skin and occupies the other side of his senses. He tries to look at himself from any point whatever in space. He feels himself becoming space, dark space where things cannot be put. He is similar, not similar to something, but just similar. And he invents spaces of which he is "the convulsive possession." All these expressions shed light on a single process: depersonalization by assimilation to space, i.e., what mimicry achieves morphologically in certain animal species.

(Caillois, 1935).

The *South* book attempts to reconstruct some of these experiences and *assimilations to space*, both in its structures and in the exercises readers are invited to take part in. Ivan Dâr, the central character of *South* is framed as a man literally in search of himself, struggling with both 'breaking the boundary of his own skin' (as Callois puts it) and of physically locating himself. The paradoxical and borderless Klein bottle, (illustrated overleaf) is an apt representation of the condition Callois describes, and which Ivan Dâr endures, 'a space where things cannot be put', because he has no location in space. At times the book deliberately aims to bewilder or undermine its own readers, hinting at the possibility of space as an annihilating agency working against them, generating a hostile space by means of its aesthetic strategies and by asking readers to undertake paradoxical or impossible tasks, lying to them, issuing contradictory instructions or leaving exasperating lose ends.

Andrew Haslam (2006) describes the way in which the design of books can facilitate ‘emotionally ‘repositioning’ the reader’ (Haslam, 2006: 26). In *South* the visual language of the book is deployed to communicate and, indeed to manipulate readers, as much as its written language. Concepts such as ‘chunking’, ‘mimicry’ and ‘self-similarity’, explicated in for example Lidwell, Holden and Butler (2003), and drawing upon the Gestalt theories of Max Wertheimer⁴⁰ have been used within the formulation of *South* to generate meta-narratives through non-verbal means. These are narratives of dislocation and spatial ambiguity that reflect the wider concerns and fictional themes of the *South* project.



Figure 32 Above and next page, pages from *The South* book. Readers are invited to explore the extent to which one can be the ‘author’ of ones own narrative if one’s choice of language is defined by others. In a wider sense the book asks how language influences our experience of the world and the stories we tell. Are there other *ways of telling* available to us? Are our stories and means of communication inevitably symbolic and do computers have to operate under the same limitations?

⁴⁰ Max Wertheimer (1880-1943) was one of the founders of Gestalt psychology. The Gestalt laws of similarity and proximity established by this school are often used in the design of interfaces, *South* has been more overtly concerned with not deploying them in order to disorientate its readers.

TRANSCRIPT OF THIRD SESSION BETWEEN DR TORRO & IVAN DAR 21st MARCH
1965:

Ivan: I cant locate myself in this space, don't get me wrong, it's a beautiful office, so close to the River, nicely furnished, clean and convenient..

Dr Torro: Well, Ivan, you could say each person has an impression of his own manner of speaking, walking, and carriage which seems personal and immutable-the only possible way-and he identifies himself with this image. His judgment of the spatial relationships and movements of his body seems innate, and he believes it is possible to change only the vitality, intensity, and capability of them. But this is not fixed in stone. You we might say, have an unmetabolized coordinate system, it's proper calibrations can only be acquired through a long apprenticeship, perhaps many years.

Ivan: I get lost every time I come here, its true.

Dr Torro: Your 'lostness' as we might call it, is not geographic in the conventional sense, but somatic across all latitudes.

Summary

The *South* book asks to what extent space is enmeshed with culture, are they separable or mutually constituting elements? Does a censoring culture (such as the one that limited the linguistic freedom of my grandparents) inevitably generate a repressive space, how does this operate within the spatial dimensions of cultural and linguistic artefacts, including books? The true story of my grandfather (and also of my grandmother) and his fictional counterpart Ivan Dâr has echoes in Italo Calvino's *The Castle of Crossed Destinies*, in which a group of travellers lose their ability to speak, but instead use the imagery of Tarot cards to communicate their stories. *South* explores various means of communication, including the visual, the aural the corporeal and ideas of supernatural or intra-psychic communication. The verbal and non-verbal stories embedded in *South* are framed as a form of generative research practice. Readers are invited to extend the themes of these stories through the various exercises and encounters generated by their navigation of the South Bank. The autobiographical references are part of a process that involves a productive

uncovering of my own subjective and partial perspective within both the analogue and digital *South* systems. My own subject specificity is also framed as in many ways historically and culturally conditioned. The importance and meaning of locating my own subjectivity as well as various design strategies deployed within the layout of the *South* book are explored in the next section as well as the wider historical context of artist's books and multiples.

4.3 Artist's books and meta-criticality

The continuum of artists creating books goes back to the earliest days of book production, indeed Johanna Drucker cites the fact that:

Many printers, typographers, and publishers were acutely aware of the book as a form and displayed this awareness through their production. Aldus Manutius' *Hypnerotomachia Poliphili* (1499), Geoffrey Tory's *Champfleury* (1529) and the Firmin Didot *Virgil* (1798) are examples of highly self-conscious productions of work in book form.

(Drucker, 1995: 21).

But, as Johanna Drucker explains (1995) an exquisite concern with production values is not the same as a critical work that engages with and challenges the book form. This section will look at the provenance of the *South* book, briefly surveying the historical context of the artist's book as an established form while addressing some of the ways in which *South* diverges from the multitude of artist's books created from the 1960s onwards. I will also discuss the problematic and complex role of what Drucker calls 'Self-reflexivity in book form' (161), in terms of both the book's structure and issues of situatedness and subjectivity. Finally I will discuss the specific aesthetic strategies that I have applied to the production of *South* in order to expand its narratives beyond the lexical and the explicative.

Artist's books

Many of the earliest artist's books, (more correctly known as *livre d'artiste*), were produced to extraordinarily high specifications, but they were often not designed by artists but by artist's agents wishing to extend their commercial reach. Johanna Drucker identifies the artist's book as we currently perceive it to be a mid-twentieth century conception:

There is no doubt that the artists' book has become a developed artform in the 20th century. In many ways it could be argued that the artist's book is the quintessential 20th-century artform.

(1).

While Johanna Drucker acknowledges the diversity of works that fall under the aegis of artist's books, she also identifies key features that distinguish the artist's book from earlier lexical works; these represent a critical 'zone of activity' (1) and a high degree of engagement with the philosophical significance of books. Joanna Drew in (1976) pinpoints a preoccupation in artist's books with 'written text and photographs which has become a byword of the art of the 1970s' (Attwood et al, 1976: 7). While Drucker is more nuanced in her attempts to describe the form, asking whether it is enough for a work to integrate the 'formal means of its realization and production with its thematic or aesthetic issues' (Drucker, 1995: 2). These issues, for Drucker, only raise more questions, such as 'Who is the maker?', and 'Does it have to be a unique work?' (2); both of these questions are highly relevant to my own work, in which the physical construction of the book is distributed between myself and those who produce it. As I expect my readers to write and draw in my books one might ask if they are also complicit in their physical construction, or merely 'interacting' with them.

Drucker concludes that none of these questions can be easily resolved. Alternative book structures such as multiples only add to the ambiguity of the form. In the 1970s

Dieter Roth produced complex works such as *Snow*, (1970) that deployed 'overlapping pages whose structures in his early works served to sculpt the books intricate interior space' (74). Roth also deployed random content as a disturbance of orthodox means of mass production, while other artists such as Ed Ruscha, deliberately adopted more conventional forms, for example his 'Twenty-six Gasoline Stations' (1962), 'Various Small Fires and Milk' (1964) and 'Nine Swimming Pools' (1968), all conform to the same format.

Drucker describes Ruscha's approach as 'designed to neutralize the physical and structural features of the books by making them as conventional and inconspicuous in material terms as possible' (75). Daniel Buren's documentation of his own sculptural work is an interesting example of site specific artist's books, in which a complex interrelationship is established between the work, the site and the book form, as is Jan Dibbet's *Robin red breast's territory/sculpture 1969* (1970), which 'with the aid of text, maps and photographs conveys to the reader the sculptural idea, which was to alter the form of the bird's territory, as well as its realization' (Atwood et al, 1976: 35-36). Other ideas within the domain of artist's books such as *textual art*, represented for example by the group *Art and Language* (1968, Terry Atkinson, David Bainbridge, Michael Baldwin and Harold Hurrell), also have philosophical and aesthetic resonance with my own interests, though it should be noted that *Art and Language* endured an ambivalent reception, their output was described by Attwood et al (1976) as 'strikingly unsuccessful' (52). In the catalogue to the Arts Council of Great Britain's *Artist's Books* exhibition of 1976, Atwood et al write:

You knew it was supposed to mean something, and you even sensed that sometimes it succeeded in meaning something.....As with a semi-foreign script or lay-out of half comprehended ideograms, the units of meaning could be dimly made out but seldom the syntax which bound them together.

(55).

Art and Language, like the first hypertext fictions writers, may have suffered from attempts to embody philosophies of language in an all too literal and laboured

fashion. Ian Breakwell's textual and photographic works, on the other hand, represent a highly engaged, diverse and searching practice that goes beyond the notable failures of *Art and Language*. His work resonates deeply with the *South* project. Breakwell's diaries, for example *BC/AD [Before Cancer/After Diagnosis]*(2004), embed subjectivity and embodied identity into the book form, through drawings, words, digital images and collage, laying open his experience of inoperable cancer (as my character Ivan r does in relation to his own illness). Breakwell's political and autobiographical concerns and his interest in the relationship of photographs and cinematic forms to texts are brought together in works resonant of mass observation, and also therefore of market research and surveillant practices, which my work also addresses.. Breakwell's works such as *Seeing in the Dark* (1990), and *Brought to Book* (1994), are a valuable and affecting reference to this project, not least of all for his ability to locate his own life within these works without indulgence or narcissism, arguably advancing it beyond flâneury or the closed systems and self-referential failures of *Art and Language*. Ian Breakwell's negotiation of both autobiographical content and site-specificity exist within a larger context of artists rooting their practice and theory within their own experience. This is frequently referred to as 'reflexivity', but as the next section will show, it is a practice that comes with its own potential difficulties and obstructive conventions.

Verso and recto: multiple reflections and conceptual spaces

As I have stated earlier, the use of autobiographical references in the *South* book is not intended as a solipsistic form of self-revelation. Auto-biographical material is embedded as part of a wider commitment to framing my own subjectivity as a location within the *South* project and to undermining any illusions of neutrality in this work⁴¹. Such self-placing is often described as 'reflexivity' and it is important to acknowledge that many artists and writers have (particularly since the 1970s onwards), brought a high degree of reflexivity to their practice, in which they have

⁴¹ As I have explained elsewhere in the thesis my own subjective responses are embedded in the software as quantitative factors that influence the way the software generates content and its overall emotional tone. The software will be parsimonious and sarcastic with users who are significantly different from me.

analysed and critiqued their own creative processes and assumptions (notably reflexive book artists from the canon of late twentieth century book art include Emmett Williams (1984), Helen Douglas and Telfer Stokes (1987)). But this term, as identified by Haraway (1997) and Barad (2007), is complex and contentious. Haraway and Barad (among others) frame reflexivity as problematically directed in orthodox, circular, notions of cause and effect. Haraway writes of the limitation of reflexivity, 'which seems not to be able to get beyond self-vision as the cure for self-invisibility' (Haraway, 1997: 33). Haraway frames reflexivity as symptomatic of the problem it aims to address, that of the invisibility or spurious neutrality of the scientist. 'Reflexivity is a bad trope for escaping the false choice between realism and relativism', Haraway explains (16). Instead she proposes a 'diffractive' methodology, in which 'the production of difference patterns might be a more useful metaphor for the needed work than reflexivity' (34). Diffraction suggests a less solipsistic form of knowing than the reflected understanding implied by reflexivity, it suggests the possibility of generating new knowledge without negating our own embedded perspectives and experiences.

Despite the stringent critiques of reflexivity outlined above, the essential idea that research observations are not independent of the observer is still important within this thesis, both for the reasons defined by Graeme Sullivan, who frames 'reflexivity' as acknowledging the 'positive impact of experience as a necessary agency to help frame responses and to fashion actions' (Sullivan, 2005: 62), and as the bedrock for a more ethically centred practice, as defined by Haraway and Barad.

An alternative to reflexivity posits the need to account, where possible, (given the paradox of this undertaking) for ones own epistemic systems and wider agential forces. The recognition of extended notions of agency arguably takes reflexivity beyond the circular systems proposed within social theory. However, Johanna Drucker's point in (1995) is specific to the form of the book. While I arguably extend Drucker's notion of reflexivity to include the necessity of exploring my own socio-historical relationships to language and reading, I have also deployed a range of strategies to investigate the form of the book, which, as Drucker establishes, is a

salient feature of many artist's books. Such a meta-critical book can, according to Drucker represent a:

self-conscious record of its own production – it can simply examine itself as a proposition – one laden with specific ideas about the ways a book can embody an idea through its material forms. There are really two subtexts here. One is the “idea of the book as idea” – The self-reflexive creation of books which are about being books, or what a book can be as an idea in form. The other is the “idea of the book as art idea” - which takes these investigations of the book into a dialogue with the concept of art, and shows that books are an art idea.

(161).

The meta-criticality described by Drucker has some resonance with the problematic notion of art embodying theory which I discuss at length in relation to early hypertext writings in the literature review. Such self-reference must be handled with great care if it is not to collapse itself into ever tighter circles of self-contemplation. An artist's book such as Helen Douglas's and Telfer Stokes's *Real Fiction* (1987) is cited by Drucker as 'not merely about its own making, but also about its own conceiving' (195). Similarly the egg shaped interim object deployed in conjunction with the *South* book and software may be seen as a means of performing the birth of an artist's book, readers must physically perform certain functions to complete their own version of the book. *Real Fiction* is important for its attempt to frame the book as a spatial entity, bound by protocols which are deeply naturalised in orthodoxies of book design and production. On the other hand, a book such as Emmett Williams's *Chicken Feet, Duck Limbs, and Dada Handshakes* (1984) satirises stereotypical constructions of self-referential creativity within artist's book form, or as he puts it “the new genre for lightweights” (cited in Drucker, 1995: 193). My own attempts to interrogate the 'book's identity' are approached with a degree of circumspection over the potential for “strikingly unsuccessful” (Attwod et al, 1976: 52) works evoked by *Art and Language* and by George Landow's (1992) declarations over

hypertext and post-modernism's idealised symbiosis. *South* does however deploy aesthetic strategies to draw attention to both its literary conventions and departures and to reinforce a range of authorial positions throughout the text.

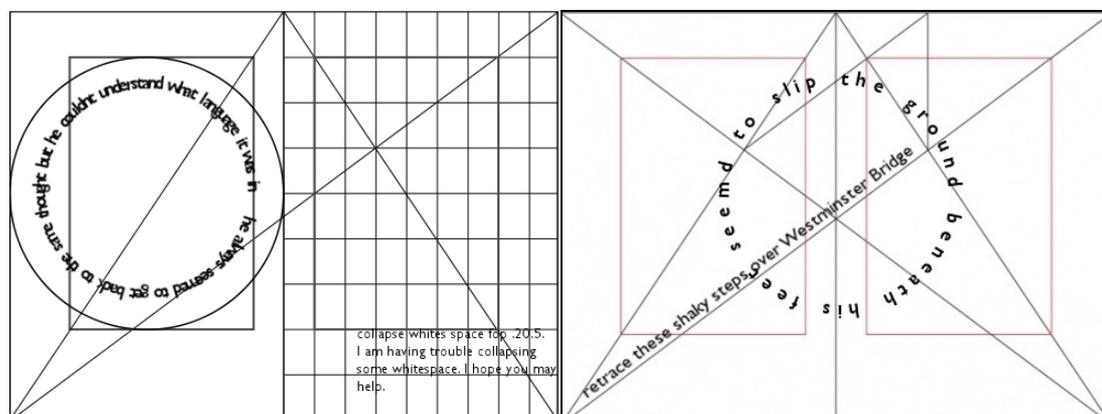


Figure 33 Above left, the golden canon used in *South*. On the right the 'van de Graaf' or 'secret canon' is not so secretly used in the *South* book. The left-hand page in a book is called the *verso* and the right-hand page is called the *recto*, these are traditionally scaled and sized identically while the principles of a design canon are applied to specific features of the page such as the position of margins and print spaces. The geometrical constructions depicted above are also suggestive of certain psychogeographic themes relating to London, such as Iain Sinclair's ideas about the architect Nicholas Hawksmoor and the geometry of theistic Satanism.

The canon of orthodox principles for Western book design is relatively narrow, with a few very clearly delineated (though often unarticulated) systems such as the Golden canon, and the Van de Graaf canon, (also known as 'the secret canon'), as well as more contemporary divisions of space. The canons are designed to elicit concepts such as harmony and balance in the design of book pages and to emphasise content over form. At times the canonical features of book design are destabilised within the pages of *South*, conveying narrative and critical positions where necessary, at other times canonical features are highlighted as expressive and conceptual aspects of the *South* system. The book designer and writer Andrew Haslam likens the design of books to stage design, authors, he writes 'provide a score and the designer choreographs the performance' (Haslam, 2005: 30), this is an appealing comparison and one that makes sense in light of my own attempts to relate the spatial and performative aspects of books to wider notions of what constitutes an

environment. Other aesthetic strategies are also used within certain pages to create imbalance and tension.

Another approach I have engaged with is the use of the architectural concept of the *prospect and the refuge*, the notion that ‘people prefer environments where they can easily survey their surroundings and quickly hide or retreat to safety if necessary’ (Lidwell et al, 2003: 156). Throughout *South* there is a balance between pages that are open and easily navigable and pages that are more secretive, these are often the verso, or left-hand pages. Other devices that can aid or undermine the readability of a page are the gestalt principles of similarity, difference and continuation, in which information can be grouped to aid its legibility or to confuse readers by grouping unrelated elements and ideas.

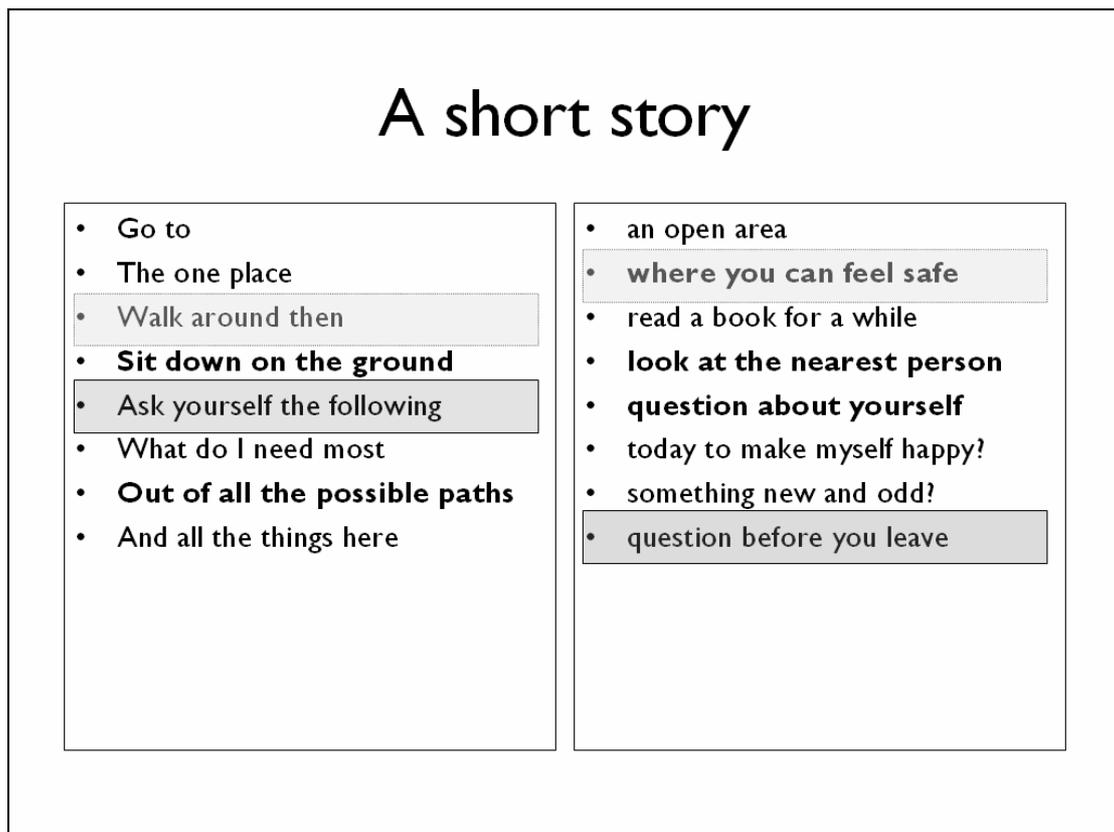


Figure 34 Above, a page from the *South* book, it uses the gestalt principles of similarity, difference and continuation to direct and misdirect the reader. Continuation is the idea that the eye can be compelled to follow a certain path.

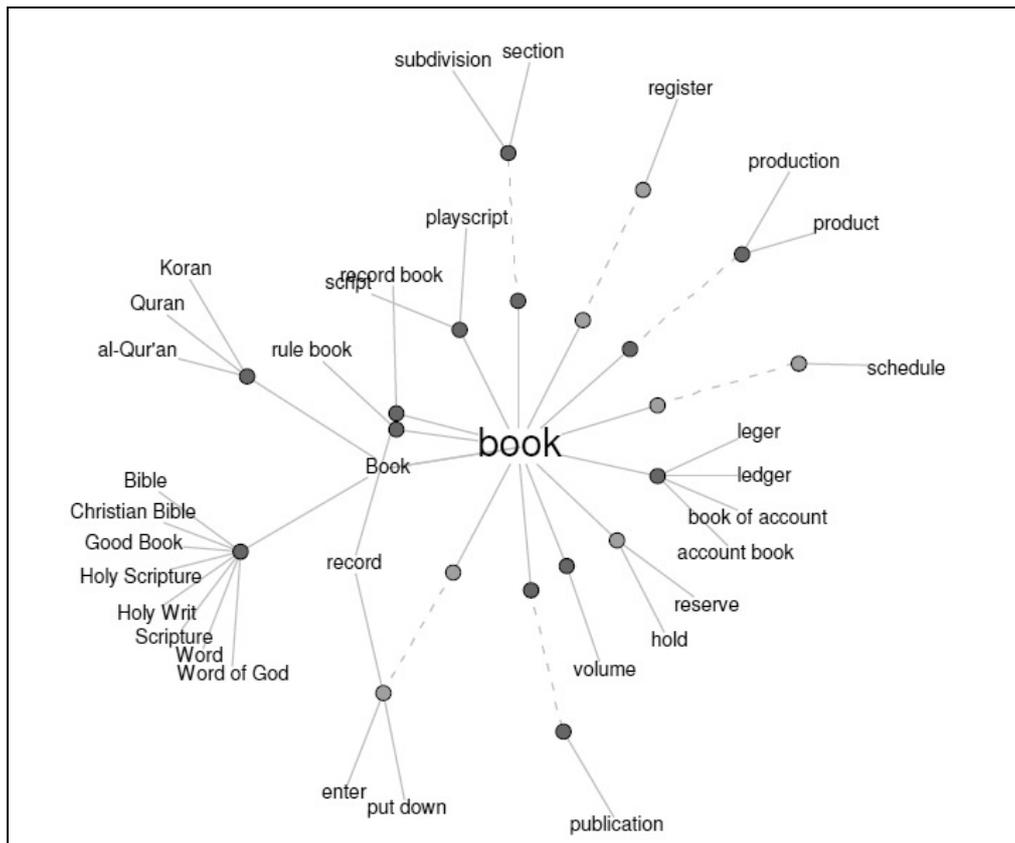


Figure 35 Above, a mock contents page from *South*. The chart traces the associations generated by the word ‘book’. The example destabilises canonical notions of linear and logical visual hierarchies as navigational aids for readers. Though the chart is still hierarchical it is arguably not spatially indicative of where readers can find further information, it is more like a map of undiscovered territories than a useful representation of significant divisions within the book. Disorientation is a key theme within the fictional writing and algorithmic procedures of *South*.

Conclusions

South works in conjunction with tailor made software and an egg that carries dynamically generated narratives, in the form of messages and instructions. The narratives generated by the *South* system and book are multi-layered. By using psychometric evaluation and the form and composition of the book as narrative mediums *South* aims to establish a complex relationship between books, their readers and the spaces which they navigate. The author of the *South* book is also framed as an overt presence within the *South* system and as an extension of the idea

of a location. The fictional stories and exploratory practices generated by the book are enmeshed with many aspects of my own cultural and socio-historical values and references, this, I argue is an important aspect of a located and situated practice which bears a relationship to Johanna Drucker's idea of meta-criticality in relationship to the book form. *South* also operates within a continuum of artists working with books and investigating the meaning of books as both physical and conceptual spaces. This section has explored some of those historical practices and has outlined the ways in which *South* shares some of the key themes of artists working with books and other ways in which my practice departs from many previous types of artist's book, most importantly in its relationship to computation and its deployment of an agent based system, outlined in chapter six.

The *South* book and egg work together in ways that have clear resonance with a number of the works I have referred to in this chapter, however, the specific processes brought to the book and egg via computation, represent a quite different form of mass production, randomness and site specificity than that of the artist's books I have mentioned. The egg may resemble a multiple, but it is a mass produced factory object that has not been designed by me. Though the content I generate for the egg is mutable and in some ways indeterminate, it is specific to sites and subjects, algorithmic in nature and, through the software I have written for it, capable of conveying some insight into itself. The *South* project therefore shares formal aspects of earlier works, including Sol LeWitt's algorithmically generated books, such as *Four basic kinds of straight lines* (1963), which follow strict generative procedures, but the *South* project also presents quite distinct features, most notably those features facilitated by the use of techniques from the domain of artificial intelligence, such as data collection and analysis, and the ability to make evaluations and learn from readers and specific situations through its agent based structures. Like many of the artists who have produced artist's books, however, I am concerned with what Johanna Drucker identifies as 'serious philosophical interrogations of a book's identity' (Drucker, 1995: 161). But the self conscious attention to book structure' (161) or *metacriticality* Drucker describes is not without its own problems, not least of all problems relating to issues of subjectivity, authorship and epistemic agency.

This chapter has sought to ground the chapters that now follow on from it, in which the theoretical and pragmatic issues raised by the *South* project are emphasised. These, as stated above, are issues of agency, subjectivity and knowledge generation, as well as historical issues raised by previous digital fictions such as hypertext fictions and text adventures. The chapter highlights the relationship between my practice and its implications for a subjective and multiply agent-based form of literary computation, and its interplay with an analogue book. But, what, one might ask, are the implications of locating my own and my readers' subjectivity within the *South* project? What do I mean by *subjectivity* and how does it relate to questions of knowledge production and agency? The chapter following the *South* book case study aims to specifically explore the historical meaning of the subject and to relate those historical ideas to the critically challenging practices and methodologies used within the production of the *South* book and software.

South: A Case Study

Scenario

The following scenario, (which could also fall under the aegis of a 'user profile' or 'persona design') shows in narrative terms how a real reader, Mašinka Savić⁴², interacts with the *South* system, outlining and incorporating some of the cultural and contextual aspects of her interaction with this work. The goal of this scenario, as

⁴²The name *Mašinka Savić* is a pseudonym.

defined for example by Gaffney (2000) is to provide concrete descriptions and to 'remove any unwarranted references to systems or technologies' (Gaffney, 2000), while allowing for a clearer insight into the context and sequence of a user's interaction.

The following example shows how the *South* system works from the perspective of Mašinka, a 43 year old woman living in South London. The subjective experience of Mašinka is investigated and emphasised, emphasising that this system is concerned with the specific reactions and knowledge generating practices of individual subjects. Mašinka is a keen explorer of London who has a long-standing interest in fiction and theatre, she is fascinated by both established and newer forms of literature. As an 'early adopter' of technologies and cultural innovations she is the archetypal *South* reader – curious, unafraid of technology and enthusiastic about London in all its diversity and intense liveliness.

User Profile: Mašinka Savić ⁴³

Mašinka Savić is a 43 year old Serb who has lived in London for over 17 years. Mašinka was born in Yugoslavia (as it was formally known) and raised in both Serbia and Western Germany (as it was then known). Her mother tongue is Serbo-Croat, (which, in relation to Serb speakers is usually now referred to as *Serbian*) but she also speaks German and English fluently. Mašinka is a technical consultant for a London-based software firm as well as a keen reader and photographer. I shadowed Mašinka as she interacted with the *South* system and asked her detailed questions about the experiences she had.



Above, Mašinka Savić on the South Bank, 16th May 2009.

Name: Mašinka Savić.

Age: 43.

Born: Yugoslavia (in what is now called Serbia).

Lives: South London.

Profession: Technical Consultant.

Likes: Fiction, photography, theatre, film.

⁴³ Mašinka Savić is a pseudonym.

Excerpt from the *South* book, all readers, including Mařinka, should read this section.

So what is *South*? *South* is an instrumental discrimination borne out of the fact that without a North there is no South. It is a navigational system created by your own networks of meaning. *South* is a reference axis emanating from the South Bank area of South London. It is perfectly possible to find a slippery surface, lay this book down upon it and spin it round to create a new orientation; perhaps we could call it *Weast* or the *South East Pole* as my Grandfather put it. Whatever name you choose, the particular form that your journey to this destination will take is the subject of this book. The author and publishers wish you great luck on your journey, however they would also like to point out that they cannot accept legal responsibility for any strangeness, temporal or subjective dislocation, psychogenic *slippages* or other oddities that might result from it.

Excerpt from the *South* book, Story 2.

Mašinka is specifically instructed by the software (via the egg) to read this story and follow the exercise at the end of it. The story is 'written' by the fictional protagonist of *South*, Ivan Dâr.

Degrees of freedom

If I am supposed to be writing an autobiography there is a fundamental flaw in the contract which my publishers have hitherto not noticed - there is no real 'I' to *autobiographize*. Although it is true I use this solitary symmetrical construction on a habitual basis. This 'I' of which there is no solid empirical evidence represents a vast number of un-useful habits – the continuous construction of un-resourceful representations, self destructive symbols, phobias and fear. Taking a small stroll through Borough Market will expose a cornucopia of such fears, the fear of not having material things and sensuous experiences, to name just two. You may retrace these steps yourself; beginning perhaps by the ship of avaricious cruelty we currently call the Golden Hind. A boat that represents every malignancy you can care to name. Start there, at this mendacious centre piece of Thames-side reverie.

Have I lost you yet? Who are you anyway? Those of you who are expecting to read a scientific treatise should already be dismayed by the subjective slant of my writing today. Others may be wondering what on earth I am doing using such resources – as the phobia, the displacement, the un-resourceful representation. Are these theoretical resources? Are you interested? Do they fit into a programming language as remotely valid entities?

My goal may once have been to make you all say a resounding communal 'yes' following a meticulous submission to the elegance of my logic. But there is no longer an 'I' to either persuade or be persuaded.

We are largely sets of unobservable relations, to even use that term implies an anthropocentrism I cannot support, nor yet can I support any form of essentialism. This is the world as I encounter it today. Tomorrow I plan to write a chapter on differential geometry and group theory that will clarify my slippery realism. I will present the case for manifolds, transformation groups and vector fields as fitting processes for a differential morphogenesis that works across both time and space, a philosophical terrain that consists of both the singular and the ordinary. In short a multiplicity, a set of relations and a rate of change.

INSTRUCTIONS:

Walk from the Golden Hind to Borough Market. You will surely become increasingly aware of gustatory representations. Can you resist them? What happens if you do? After 20 minutes suspend resistance, now what do you do? Write down exactly what happens. Describe before, after and during. Describe urges, flavours and regrets. Next time you come here do the same exercise. Note carefully any differences between each visit. In this way you will understand your own degrees of freedom.

Mašinka's relationship to language

In our initial interview Mašinka highlighted the importance of language in her life. Mašinka told me that her fluency with languages is both a pleasure and an advantage but also a source of existential uncertainty. When she returns home to Belgrade (Beograd) she sometimes forgets which language she should be speaking. If she has been on a recent business trip to Germany her grasp of language is even more confused, sometimes she will talk to me using English, Serbian and German words in one sentence. Mašinka hates speaking German even though she lived in and was educated for long periods there. 'It hurts my tongue' is one of her catch phrases. She cites the reason as a deep-seated resentment of the racism she experienced as the child of Gastarbeiter, though Mašinka does have a number of close German friends. I have known Mašinka for many years now, long enough to sense that she would be a valuable evaluator of the *South* software and book; confusingly I also think that elements of Mašinka's personality and life experience have crept into my fictional depiction of Ivan Dâr. Far from representing a problematic loss of objectivity I see this as an enhanced aspect of Mašinka's role as a case study and evaluator, but would Mašinka recognise or even find herself in the pages of *South*?

How many languages can you speak?

Three : Serbo-Croat, German and English, I'm also learning Spanish at the moment.

Please describe what language means to you:

It's helped with my work, and I have a lot of friends and colleagues who I can speak to in their first languages, but I sometimes get confused about which language to think in, I feel unsettled in some ways, I don't know where I belong', I feel restless in myself.

'Who am I? A Yugoslavian, a Serb? But the languages mean I'm thinking in English and German too. It isn't easy to explain, other multi-lingual friends of mine feel the same way, we can't explain it to other people, we have all spent our childhoods between different countries.

(Feedback from Mašinka Savić, May 2009).

Relationship to technology

Although Mašinka is a technical consultant within a branch of the computer industry, she is also cynical about computers and technology, she is particularly wary of the hype surrounding technology and is scathing, for example, about what she sees as the pretentiousness of Apple Mac users (this came out humorously in her exploration of the South *algorithms*) Despite her cynicism Mašinka has many gadgets, and is arguably what the technology industry might describe as an *early adopter*.

Please describe your feelings about technology:

I am in two ways when thinking about technology, I love it because it makes my life easier, more interesting and enables me to talk to my friend Dragana every day, despite the fact that she lives 2000 miles away. But when my technology lets me down, doesn't do what I want it to do, then I can't stand it.

(Feedback from Mašinka Savić, May 2009).

Interacting with the *South* system

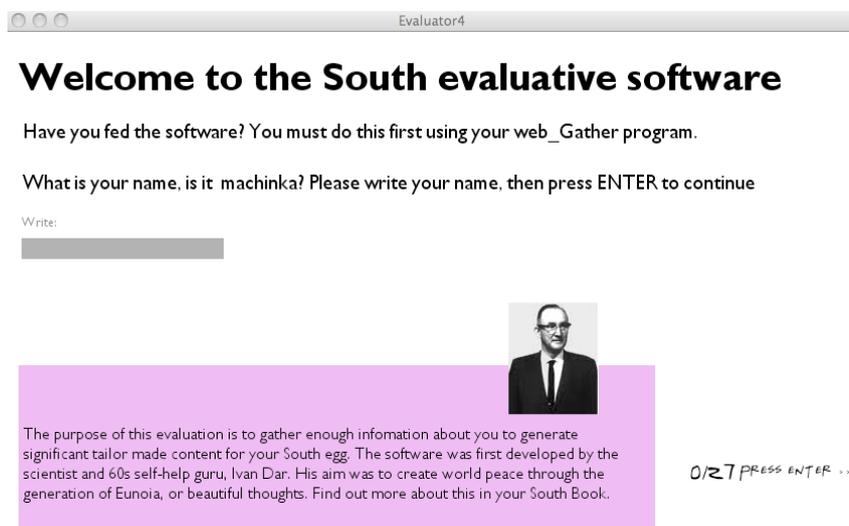
Mašinka's exploration of the *South* book and software begins with a detailed psychometric evaluation, which could also be described as an investigation of her subjectivity and personality traits, current moods, needs and goals. The evaluation follows two modes, via the book and then via the computer software, which was distributed to Mašinka with the book. The first mode of assessment, via the book, establishes a notion of her type, based on fixed procedures, the second mode, via the computer, accommodates contextual changes and other dynamic factors, to generate a more subtle sense of Mašinka's defining characteristics and their relation to wider forces. As the narrative will show, these evaluations help the *South* system to generate up- to-date content for the egg (or effector⁴⁴).



The egg image-display device. It displays content which is generated by the software and then uploaded into it.

⁴⁴ An effector, as its name suggests, generates effects or consequences, it is therefore agential, albeit to a limited degree; in this context it means that the egg will make things happen, it will give instructions to human agents who will undertake tasks and cause things to happen in the world.

Psychometric evaluation



Above, the opening screenshot from the *South* evaluation software. The software takes Mašinka through a series of questions designed to identify her current mood and interests.

After going through the evaluative exercises Mašinka discovers that she is defined by the South system as a **Crik**, (though she is also very close to being an Um). A Crik is one of the so-called 'personality types' constructed by the fictional protagonist of the *South* book, Ivan Dâr (a psychologist with his own identity problems). The types defined in the book correspond to the more well known traits: Extroversion (Um), Introversion (Lerq) and Sociability (Crik). These traits are contentious; the *South* book treats them as opportunities to explore the notion of fixed and schematised personality types.

Crik: A Crik is somewhere between an extrovert and an introvert, her evaluation as a Crik does not surprise Mašinka, she recognises in herself both sociable and outgoing traits and also a side of herself that is able to cope with being alone and indeed thrives on a small amount of solitude.

Please describe your feelings about being classified as a Crik:

It's true I do like being around people but I'm ok to be alone too, I mean it's not the end of the world and I can enjoy it - but not for too long. Basically I like being around other people, I don't like spending too much time with just myself, it gets boring!

(Feedback from Mašinka Savić, May 2009).

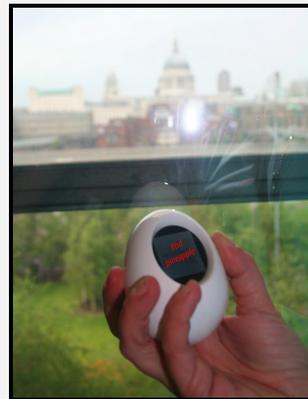
The computerised evaluation:

The *South* software enables a more complex evaluation than the *South* book, on this occasion it has detected quite a lot of negative content on the web, financially the country (like the world) is in trouble, the expenses scandal in the Houses of Parliament has also been detected by the system and contributes towards generating a negative weighting. The weather is rather drizzly and unpredictable as well. On a more personal note the system asks Mašinka to react to some CCTV images of the South Bank, and to current news headlines, this data is also assessed by the software agents that work within the *South* system. A language agent examines Mašinka's vocabulary, looking for a 'linguistic style' that might reveal significant factors about her.

Loading content into the egg:

Having completed both the book based and computer based evaluations Mašinka can now instruct the software to generate content for her egg, she then loads it into the device via a USB cable.

Below left, loading content into the egg via a USB cable. The content consists of Images generated by the *South* software. The images contain written and image-based instructions (right). The instructions sometimes tell Mašinka which pages of the *South* book to read, or things to do on the South Bank.



The egg content tells Mašinka (via its images) that the weather forecast is for rain and that the pollution levels are low. These facts are reflected in her tasks.

Task example: What does wet grass smell like? What memories does it evoke?

I remember the smell of wet grass around my grandfather's dacha, up in the mountains; it smelt sweet and fresh. He would cut the grass with a huge old blade, a scythe? At night I would be frightened because I could hear wolves howling near the house, funny how a smell can remind me of this.

(Feedback from Mašinka Savić, May 2009).

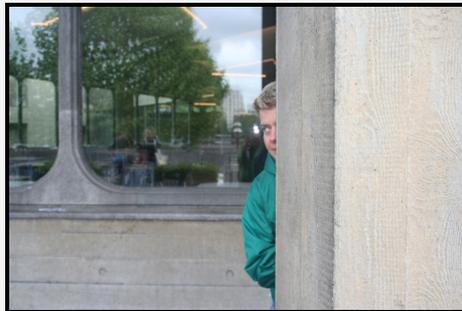
Algorithms: Journey to the South East Pole

Mašinka can now investigate the core components of the *South* book and egg which are its algorithms or activities. These are defined by the processes she has just undertaken. Depending on her 'type', and on the contextual factors detected by the software, each reader's experience will follow a unique path.

The algorithms centre upon a journey to the mystical *Axis Mundi* or *South East Pole*.



Above, Mašinka's journey begins at the Golden Hind, St Mary Overie Dock SE1, the software chooses a location for her to explore and instructs her to go there through the image files she uploaded into the egg.



Above, Mašinka's first task requires her to spy on passers-by and choose suitable 'expedition members' to accompany her on her journey to the South East Pole, these individuals will not literally accompany Mašinka, but will be fictionalised in the *South* book through Mašinka's own writings.

Algorithm Example:

Mašinka is asked to choose expedition members to accompany her to the South East pole:

Second-In-Command

Name: David



Above, a photograph taken by Mašinka. She chose the man from passers-by to be her fictional second-in-command.

Age: 34

Briefly describe this person: *Physically he is lardy with a big beer belly, a bit clumsy because of his size. He is very tall. He would be handsome if he would do some fitness exercises and dressed more reasonably.*

(Mašinka Savić, May 2009).

Epistemological investigations, Mašinka as a reader-researcher

Mašinka took several photographs during her 'psychometric text adventure'. These images are now incorporated into the *South Book*, as well as the writing exercises generated from her interactions. Taking the photographs involved thinking about her relationship to the South Bank location, how did she react to certain textures and sounds? What can a location tell her about herself? *South* uses the environment as a form of psychometric and epistemological apparatus, asking and enabling specific subjects to investigate how they generate narratives about a location. The book and software explicitly asks subjects to ask themselves not only *what* they know about a location, but *how* they know. The *South* software can dynamically guide reader's to forms of knowledge generation that they might not usually be conscious of, such as embodied and skills based knowledge, or more symbolic forms of knowledge generation, involving a priori hypotheses and conditional logic. The software does this by asking Mašinka to engage in tasks such as writing, describing, making certain types of movements, tasting and touching, in other words to use a range of epistemological options to explore both herself and the South Bank.

Below, Mašinka's photographs, the *South* software generated content for her, the content instructed Mašinka to take these photographs.



Myself as a texture.

(Feedback and image by Mašinka Savić, May 2009).



Something I like – the London Eye and the sky.

(Feedback and image by Mašinka Savić, May 2009).



Something I don't like – rubbish.

(Feedback and image by Mašinka Savić, May 2009).



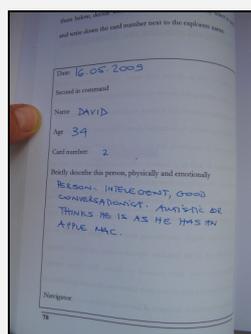
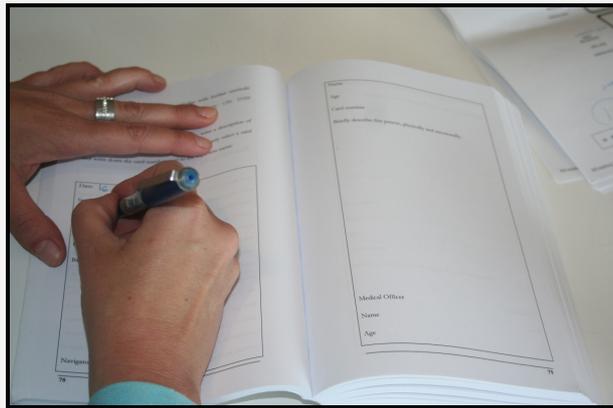
A female place – champagne bar.

(Feedback and image by Mašinka Savić, May 2009).



A male place – a concrete staircase.

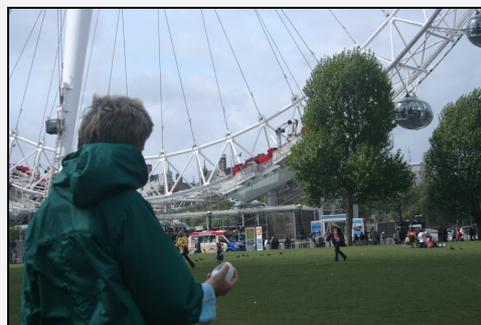
(Feedback and image by Mašinka Savić, May 2009).



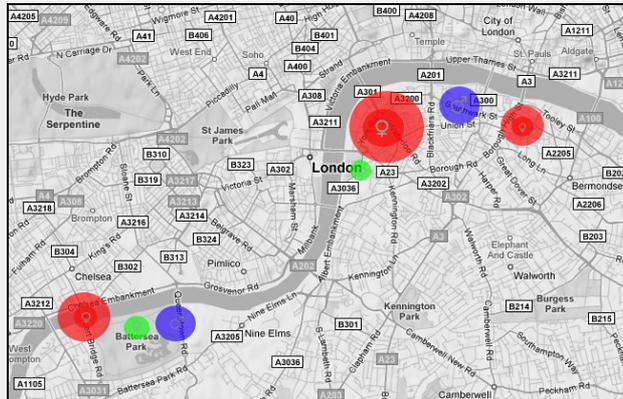
Above, Mařinka engages in a range of activities suggested by the egg content, these often involve generating her own content for the *South* book through processes of observation and writing, as well as photography.

Subjective Relationship to space

Many of the exercises are about Mašinka's subjective relationship to space, these exercises involve exploring the area around the South Bank through a range of sensory engagements – listening, touching, and tasting, smelling and hearing. The exercises particularly focus on listening, a skill that Criks and Ums often need to refine. The photographs of Mašinka were taken as I 'shadowed' her interactions with the *South* system.



Above, Mašinka at the South Bank, May 2009.



Above, Mašinka places dots in the *South* book (in which there is a map of the Thames) to indicate her feelings about different areas; she puts red dots on areas she feels are not very safe for her. The size of the dot indicates the magnitude of her feelings. Blue dots indicate areas of enjoyment and excitement. Green dots represent areas of relaxation.

Outcomes

What happened?

I could come back and do this again and the experience would be completely different, it's an unusual way of being somewhere – asking questions about the place and looking at my own reactions. I've never really thought about how I feel about textures or sounds in this way. It was interesting – I think I'll do this with other places, make up my own exercises....I do see some strange similarities with the character, Ivan, his name could be Serbian! When I read the stuff about him not being allowed to speak Welsh it reminded me of Balkan history – language has historically been used as a weapon somehow, to try and hurt peoples Identity. Speaking another language can feel like a test, in Germany if you are an 'outsider' there's always that chance that they expect your speaking of their language to be inferior, and then this is made to mean you are somehow inferior in their eyes, at least that's how it felt to me, though I speak Hochdeutsch or 'high' German, which is posher than a lot of Germans! I understand why the character became confused – he just didn't know who he was.

(Feedback from Mašinka Savić, May 2009).

Summary

New material

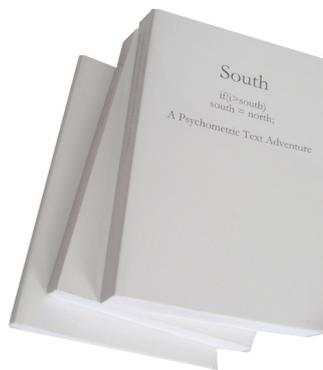


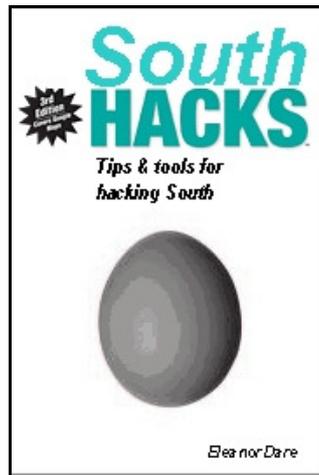
Figure 36 Above, the *South* book in different editions, Mašinka's content has been added to the book and represents a new edition. The updated book is available on the internet. Readers can submit new content via the *South* project website. Publish-on-demand technology makes it possible to rapidly update and re-issue versions of the book.

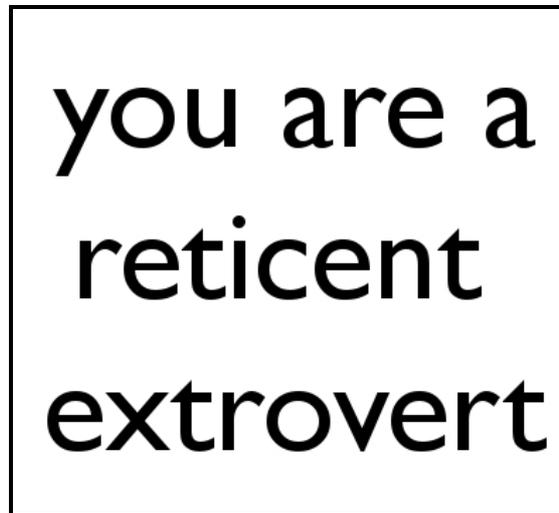
Mašinka took several photographs during her 'psychometric text adventure', and did a number of drawings in her book; these images are now incorporated into the *South* system, as well as the writing exercises generated from her interactions. Taking the photographs involved thinking about her relationship to the South Bank location, how did she react to certain textures and sounds? What did the location tell her about herself? *South* uses the environment as an expansion of psychometric apparatus, but the reader, in this case, Mašinka, is also reframed as a resource for expanding the book, both in terms of content and any new ideas or exercises she can bring to it.

Mašinka's interaction with the *South* system is not over. The system is designed to evolve in relation to readers and to incorporate their own contributions, research outcomes and any new practices readers originate. Mašinka has stated that she would like to return to the South Bank with her book and egg, perhaps in three or four months time to see how her feelings and perceptions might have altered. She also said that she might try some of the exercises in different locations, something I had not anticipated, and a welcome innovation on the basic *South* idea. Mašinka is free to expand the project in anyway she likes. As explained on the previous page if she wishes she can publish her own variation on the *South* Book. In this sense the *South* project is an Open Source project, both as a form of literature and technology.

An additional level of user design is also solicited through the possibility of user based re-configuration or *hacking* of the *South* software. This is facilitated through a book within the *South* book called *South Hacks*. *South Hacks* enables readers to 'hack' into the *South* software and transform it by accessing and rewriting my Java and Processing code. These 'hacks' can be resubmitted and incorporated or embedded into the *South* software for future readers, even at the expense of destroying the system. (*South Hacks* is embedded within the *South* book, as a book within a book, and is also available online here: <http://www.doc.gold.ac.uk/~ma50led/south/Hacking%20south.pdf>). Likewise participatory stories, photographs and drawings have become permanent elements within new editions of the *South* book. On this occasion, however, Mašinka did not choose to hack into the *South* software.

Figure 37 Below, *South Hacks*, a *how to* book for ‘hacking’ into and transforming the *South* software via its Java and Processing code. The book examines the algorithms that form the *South* software and explains how readers can reformulate them.





you are a
reticent
extrovert

Figure 38 Above, text generated by the *South* software for a specific reader.

Chapter 5: A Psychometric text adventure. Navigating subjectivity along the South Bank.

'Apart from the experiences of subjects there is, nothing, nothing, nothing, bare
nothingness.'⁴⁵
(A.N. Whitehead)

⁴⁵ A.N. Whitehead (1927-1928, 1985:67) cited by Paul Stenner, *A.N. Whitehead and Subjectivity*, in Blackman et al 2008.

Subjectivity and interactivity are the two key areas that inform my research and practice. The theoretical discourses around subjectivity that I have researched identify many problematic aspects in relation to the very notion of a subject, subjectivity and the supposedly diametrical construction, objectivity. The idea of individualism as a philosophical position (as opposed to an unquestionable phenomena) is now quite widely accepted, in, for example, the writings of Derrida (2002), Deleuze (1981), Hollway (1984, 1989), Foucault (1988) and Alcoff and Potter (1993). In these writings orthodox notions of the subject are held to be normative, static and solipsistic. The challenge of creating the *South* system has been to work in practical terms with these insights, to integrate new conceptions of the subject and subjectivising processes into my creative practice.

This chapter will outline those criticisms and show how they relate directly to the *South* project. In addition to my own practice, useful examples of artists working with issues of subjectivity are found in projects created by, among others, Jeffrey Shaw and Graham Harwood, and the playwright Martin Crimp. Their work will also be examined in this chapter. Firstly, I will discuss the problems associated with Western notions of the subject and the tensions that these points of conflict raise in relation to my own work. I will show how the notion of a unitary, rational and essentially disembodied subject has informed many of the assumptions embedded in notions of interactivity. My own work is particularly engaged with issues of evaluation, of constructing a model of a subject within my software and writing. I will explain the background to these problems and the way in which I have attempted to creatively destabilise evaluative processes such as repertory grids⁴⁶ and psychometric tests.

The middle section of this chapter will explain new conceptions of subject-object boundaries exemplified by Barad's (2007) idea of the intra-active, it will also look at the notion of situated knowledge proposed by both Haraway (1991) and Suchman

⁴⁶ The repertory grid technique is based on George Kelly's *personal construct psychology*, developed in the 1950s. It is a positivist form of personal assessment in which subjects delineate their own constructs or *hypotheses* about themes such as relationships and work.

(1987, 2006). The later half of the chapter explores issues of embodiment and their implication for a new form of experiencing both narrative and computational interfaces.

Finally, I will expand upon how my practice has emerged in relation to theoretical ideas of the subject and subjectivity, illustrating in detail what I did, how I undertook my work, why this work is relevant and original, and what results or conclusions have arisen from it. As mentioned, I will look in some detail at the work of other artists concerned with subjectivity and subjectivising processes.

5.1 Problems of subjectivity and evaluation

The *South* system is designed to guide readers through an initial process of subjective evaluation in order to generate appropriate content, both factual and fictional, about the South Bank area of South London. The processes deployed in this evaluation are the result of research into psychometric techniques but also of research into critical thinking around the very notion of obtaining an objective, categorical and stable assessment of an individual's personality. My research indicates that all of these terms and indeed, all of these practices are problematic, but my research also indicates that there is a call for an alternative form of investigation into subjectivity and subjectivising processes. The philosopher Rosi Braidotti (2002) is energetic in her call for 'more innovative and creative energy in thinking about the structures of subjectivity at a time in history when social, economic, cultural and symbolic regimes of representation are changing very fast '(Braidotti, 2002 : 73). But Braidotti also asks, is the 'model of scientific rationality a suitable frame of reference to express the new subjectivity? Is the model of artistic creativity any better? How does it act upon the social imaginary? Will *mythos* or *logos* prove to be a better ally in the big leap across the post-modern void?' (173). It is interesting to note that a writer who so keenly identifies the dangers of either/or thinking should create, albeit rhetorically, an opposition between scientists and artists, as if art can represent everyone anymore than science can. Writers such as Braidotti, (2002) Alcoff (1993) and Hollway (1984, 1989) have cogently argued that Western notions of the subject

have been predicated upon universalising and damaging sets of dualisms, and in doing so these dualisms have shaped almost every aspect of Western culture, establishing entrenched, polarised forms, of knowledge production. Foremost in the oppositions established by a Western conception of the subject are the separations between body and mind and between the individual and their society.

The Cartesian Cogito

My initial research into subjectivity pinpointed the centrality of the Cartesian *Cogito* in Western conceptions of the subject and of dualistic modes of thought. The *Cogito* is characterised as a unitary, rational and cerebral subject. Feminist epistemologists such as Alcoff and Potter (1993) and Grosz (1994) emphasise the historical identification of the *Cogito* with masculinity, and by implication with a polarised construction that frames the feminine as irrational and corporeal. My practice aims to connect the problematic constructions of the subject I have identified to computational structures and conventions, in particular to some of the assumptions embedded within orthodox conceptions of interactivity and agency. These assumptions are also relevant to many computational works that generate and reformulate various types of narrative, in particular to works that make claims for the democratisation of writing, identified by Mateas and Sengers (2003) as works in which the computer is framed as a value free or neutral conduit for 'utopian navigation' (162).

The notion of neutrality is embedded in the empirical, positivist⁴⁷ subject who emerged from the paradigm of the Cartesian *Cogito*. Such a subject is someone for whom the senses activate a solipsistic, singular ability to detect universal truths. The absence of this ability is framed as a systemic failure, such as the state of being female, non-white or in some other way excluded from access to a received conception of rationality. If this appears to be an extreme characterisation of Western notions of the subject it is important to remember that this idea of the

⁴⁷ Also referred to as the 'empirical-positivist' subject, by, for example, Code in Alcoff and Potter (1993).

subject is a limited conception. Such a construction was also used to justify disenfranchising and enslaving subjects due to their perceived inability to reason. Within living memory British women were denied the vote on the grounds of this incapacity, indeed in Switzerland women did not get the right to vote until 1971; two conservative half-cantons, Appenzell Ausserrhoden and Appenzell Innerrhoden did not grant women the right to vote until 1989 and 1990, the argument being that the constitutional reference to *citizens* did not include women. Whether a person is characterised as a *citizen* or a *subject* my point is that these are not neutral or natural categories but historically and politically motivated constructions that have the same provenance as the supposedly objective or value free empirical scientific subject or knower.

These constricted notions of the subject have informed scientific practice at many levels, and, as Alison Adam (1990) writes, this includes the field of Artificial Intelligence and Computer Science. The so called 'view-from-nowhere' identified by Thomas Nagel (1986) is predicated upon universal subjects, described by Adam as 'the archetypal knowers, authors of scientific research are supposed to be anonymous. The individual is always abstract and it is held that this makes no difference to the quality of the research' (77). But, as Adam points out, this is based on an idealised construction of the knower: 'these "subjects" are interchangeable only across a narrow range of implicit group membership. And the group in question is the dominant social group in Western Capitalist societies: propertied, educated, white men' (77).

The misleading presumption of neutrality is a core theme of feminist epistemologies. These presumptions have obscured the wholly located and subject-specific nature of scientific practices. Writers such as Susan Hekman (1990), Evelyn Fox-Keller (1985), Alison Adam (1998), Alcoff and Potter (1993), Code and Harding (1993) have written at length about how, in Code's words 'such beliefs derive from conceptions of detached and faceless cognitive agency that mask the variability of the experiences and practices from which knowledge is constructed' (Alcoff and Potter: 26). This is not to argue for a relativist epistemology (described by Harding as 'anathema to any

scientific project' (61)) but to argue for the appropriateness of looking at new means of thinking about subjectivity and, by extension, subjectifying processes.

Interdependencies between subjectivity, epistemology and interactivity are central to my practice, and to the writing that accompanies my research, but the issues and conflicts, and more importantly, the alternatives identified by writers such as Braidotti (2002), Hollway and Henriques et al (1984) uncover further difficulties which I will explore in this chapter, such as why, for example, certain facets of a subject appear to be immutable or resistant to change, and why companies and large organisations such as the army continue to use psychometric methodologies founded upon Western paradigms of the unitary subject.

Evaluation practices

I have focused so far on one particularly pervasive notion of the subject, the empirical subject who is able to detect truths through sensory input. This subject personifies the idealised scientific observer who is neutral and trans-historical. But I do not want to give the impression that this idea of a subject has been uncritically accepted. The conception of the subject is contentious and has been the focus of many conflicting theories. Philosophers such as Nietzsche and Spinoza challenged Cartesian philosophy. Nietzsche (1887⁴⁸), rejected the presumption of humanist agency and rational intent, and Spinoza's (1677) Monism was a direct attack upon Cartesian mind-body dualism⁴⁹. Likewise the processes of subjective evaluation developed from the nineteenth century onwards are the source of ongoing ethical and pragmatic disagreement. By and large I have chosen to work with, and critique dominant conceptions of the subject and the subjectifying practices that have emerged from those notions.

⁴⁸ Nietzsche, *On the Genealogy of Morals* (1887).

⁴⁹ See Grosz (1994) for her explanation of what she calls *anomalous philosophers*, those thinkers who 'self-consciously questioned the terms within which Cartesian dualism and all its offshoots are framed' (10) including Baruch Spinoza and Friedrich Nietzsche.

My own work asks many of the core questions that personality psychologists hope to answer through assessment methodologies. Finding answers to these questions is also useful, if not crucial, for any writer trying to build a conventional dramatic characterisation. The core questions embedded in my software and writing consist of the following:

- What are a person's most important characteristics?
- How do they adapt to specific situations?
- What drives that person? What do they want?
- What are their goals and how do they fulfil them?
- What things does a person try to avoid and how do they try to accomplish such avoidance?
- How do they cope with difficulties?
- What is their overarching sense of their *life's meaning* (if any)?

In creating a system to ask these questions I have been influenced by my involvement in predominantly commercial forms of subjective evaluation through intermittent work as a market research interviewer over a seventeen-year period. This work very often involved quantitative forms of subjective assessment. My own practice is aware of the conflicting and problematic issues at the core of subjective evaluations and personality psychology; it deploys evaluative methodologies with a view to generating critical engagement. But why, I ask myself, despite the clear limitations of these practices and in light of a growing body of opposition to fixed notions of the subject, did my various employers continue to use these techniques, and perhaps more puzzling, why did their clients continue to pay for this research?

Wendy Hollway (1984) asks a similar question of occupational assessment:

Does it work? The question immediately begs two others. First, what is 'it'? Second, what constitutes 'working'? In answer to the first question, it can be recognised more readily that psychological assessment is not a homogeneous

body of knowledge when we see it as a production in various diverse sites.

(Hollway, 1984: 27).

Hollway frames the conception of the individual within occupational assessment as a 'social technology enabling the administration and regulation of employees' (28). Within institutional assessment practices it is naïve in her terms to look for a straight forward 'progress towards truth' (27). Hollway emphasises the historical motivation within what was then called *occupational psychology*, to aid organisations with 'the complex problems of maximizing profitability' (29). It is important to note the connections between personal psychology and commercial interests, and in my work, to make overt the connections between psychological assessment methodologies and market research practices.

Repertory grids and 'Man the Scientist'

An assessment practice that I have explored and indeed, deployed throughout my work has been George A. Kelly's *Personal Construct Repertory Test* (1955), multiple examples of Kelly's grids can be found in the first half of the *South* book. These grids involve the exhaustive formulation of bi-polar constructs from which hypotheses can be tested. Constructs are obtained through a systematic process in which triads are examined in order to select the two that are somehow similar and a third that is different. The source material for these processes may be, for example, significant people and places. Exhaustive construct elicitation is designed to reveal patterns of experiential categorization or cognitive styles; these may be singular or inter-subjective. This type of personality assessment has been held up as a somewhat heterodox form of evaluation, foremost because *Personal Construct Psychology* does not incorporate notions of personality traits, developmental stages or unconscious motivations. The person being evaluated constructs their own sets of hypotheses with the aid of an experimenter or psychologist/counsellor. As such it may be tempting to view this system as an alternative to the normativising ideologies of other, more trait-oriented tests, such as Costa and McRae's version of the *Big Five*

Test of Personality (1990), Cattell's *Sixteen Personality Factor Questionnaire* (1945) or Hans Eysenck's *Big Three Supertraits* (1947), which are all predicated on more or less monolithic notions of personality traits such as extraversion-introversion, neuroticism and psychoticism. However, despite its seemingly unorthodox approach, *Personal Construct Psychology* does fit within an orthodox humanist tradition, framing its subjects as rational and innately able to identify and test hypotheses. In 1955 George Kelly wrote: 'The aspirations of the scientist are essentially the aspirations of all men' (Kelly 1955: 43). Kelly's approach is a precursor to cognitive theories of personality, in which an individual's social-cognitive style or adaptation is the key to assessing their individual psychology. It is an approach that is close to the information processing paradigms critiqued by Hayles (1999), Haraway (1991) and Barad (2007).

In framing 'all men' as tantamount to the idealised figure of 'the scientist' it is important to ask what types of knowledge and what types of men, or indeed what types of *people* this statement rejects. Secondly, it is important to remember, as Henriques states (Henriques et al, 1984), that Personal Construct Theory does not take account of the *Experimenter Effect*, in which the experimenter's own feelings, attitudes or expectations effect the outcome, nor does it take any account of the irrational, seemingly self-defeating actions of certain individuals. Personal Construct Theory ignores inconvenient or messy variables that hint at a less than rational subject. Most significantly, Personal Construct Theory is based on a conception of the rational and unitary individual, who may be influenced by social forces or social contexts, but is nevertheless distinct and separate from their society.

I have explained how my work is concerned with investigating conceptions of subjectivity and subjectifying processes within the context of a system for generating both factual and fictional writing. My deployment of these methodologies is consciously problematic, as I will demonstrate in the final section of this chapter, I have used these techniques in a way that destabilises their core assumptions and seeks to reframe subjectifying practices as performative, situated and processual. The next section looks at the implications of working with new ideas around the knowing

subject. These ideas challenge the notion of the Cartesian cogito who is implacably separate from his society. In questioning scientifically orthodox ideas of who and what a subject is, the idea of the object is also examined, including the way in which subject-object boundaries are constructed or perceived in the conception of *interactivity*.

5.2 New forms of knowledge

Rethinking the subject is closely linked to epistemology (or theories around the nature of knowledge), but in problematising Western notions of both the Cartesian and the Empirical subject or knower (who have arguably dominated Western epistemological schemas and scientific paradigms of knowledge production) what alternative forms of knowing can be formulated and what type of knowers might engage in this knowing? I have discussed how the orthodox Western subject has been narrowly construed, representing a particular group of people with their own expectations, agendas and historical specificities. I have also shown how the assumed neutrality of the idealised scientific knower has been challenged by writers such as Fox-Keller, Adam, Haraway and Henriques et al, and in fact that expectations of neutrality have been largely abandoned by these writers. Haraway is at the forefront of feminist scientists calling for a new type of knowledge that acknowledges the partial perspective and situatedness of epistemological processes. I shall explain how these ideas, in tandem with ideas about embodiment and skills-based knowledge, relate to my own practices around interactivity and to the construction of my computational structures.

Situated knowledges

The writer Donna Haraway identifies the seemingly contradictory requirements of a so-called *successor science*, a science defined by Harding (1993) as a project that will address the systemic short-comings identified in particular by feminist epistemologists and scientists, failings which Haraway defines as the 'hierarchical positivist orderings of what can count as knowledge' (Haraway, 1991: 188). Haraway frames this successor science as owning a 'radical multiplicity of local knowledges' (187). Such a multiplicity enables a new form of objectivity that can accommodate post-modern insights into knowledge production, particularly post-modernism's emphasis upon power relations, and its attack upon the implicitly universalising, grand narratives of humanism.

A successor science proposes a new form of objectivity that Haraway describes as turning 'out to be about particular and specific embodiment, and definitely not about the false vision promising transcendence of all limits and responsibility' (190). The building of multiple and multi-linear accounts of individual and site specific narratives within my own practice is corroborated in the idea of a successor science. The core insights of Donna Haraway (1991), Sandra Harding (1986, 1991), Lorraine Code (1993), Lucy Suchman (1987, 2007), Karen Barad (2007) and Elizabeth Grosz (1994) are in many ways congruent with my own practical interest in creating transparent and openly partial structures within the *South* project. Haraway writes:

The moral is simple: only partial perspective promises objective vision, this is an objective vision that invites rather than closes off, the problem of responsibility for the generativity of all visual practices.

(Haraway, 1991: 198).

Using visual practices as an example Haraway emphasises the corporeality of this sensory system, which is undeniably embodied and not as she puts it 'a gaze from nowhere' (188). Despite this, vision has been used within Western scientism to somehow signify a transcendental and neutral observer, it has been allowed in other words to 'represent while escaping representation' (188). But Haraway is keen to

point out that her notion of embodiment and particularity also serves as a metaphor for non-human forms of vision, including vision in its varied technological forms:

I would like to suggest how our insisting metaphorically on the particularity and embodiment of all vision (though not necessarily organic embodiment and including technological mediation) are not giving in to the tempting myths of vision as a route to disembodiment and second-birthing, allows us to construct a usable, but not an innocent, doctrine of objectivity.

(189).

Within my own software and writing I have embedded mechanisms for representing my own and my reader's partial perspectives. Locating oneself and the particularity of one's own vision represents an ethics of knowledge production, but also a more complex bringing together of subjects and objects, which, as I intend to illustrate by the end of this chapter, has opened up new possibilities for interactive literary processes within my work.

Non-isomorphic subjects

Throughout my practice I have used CCTV images (among other materials) taken from networked surveillance cameras located along the banks of the River Thames. I have used these images to generate subject and site specific narratives and to obtain supposedly psychometric assessments of individuals. The gaze of these apparently impartial cameras is re-subjectified by a series of both analogue and digital processes. Within the digitally instantiated works these images are dynamically taken from the web, emphasising a mutable and nomadic form of subjectivity. No image is identical to another, and yet, on the surface they appear to be monotonously similar. I understand these images, whose overt use is for the control and regulation of traffic, crime and the flow of the city, as having a direct relationship to the nineteenth century institutional photographic practices described by John Tagg (1988) as 'a proliferating system of documentation – of which photographic records were only a

part' (63). On the surface these practices are stripped of partial perspective; these may be naively described as *forensic* or *objective* images. Their origins in scientific or penal institutions camouflage an underlying perspective and partiality. But as Tagg points out: 'Like the state, the camera is never neutral. The representations it produces are highly coded, and the power it wields is never its own' (63-64).

Figure 39 following page, an algorithm from the *South* software that attempts to detect the presence of buses outside Borough tube station and below that, CCTV imagery of the South Bank (left) used within the *South* software to generate dynamic narratives (right).

```

/**
 *
 *detect the presence of buses
 *in a CCTV image of Borough
 *
 *
@param null
 *
@return void
 */
public void redDraw() {

image(arch, 0, 0, 352, 288);

// slice where I'm looking for buses
PImage grab = get(110, 25, 100, 80); // x, y width height
aPixels2 = new int[grab.width * grab.height]; //
fill(255);
grab.loadPixels();
for (int i = 0; i < grab.width * grab.height; i++) {

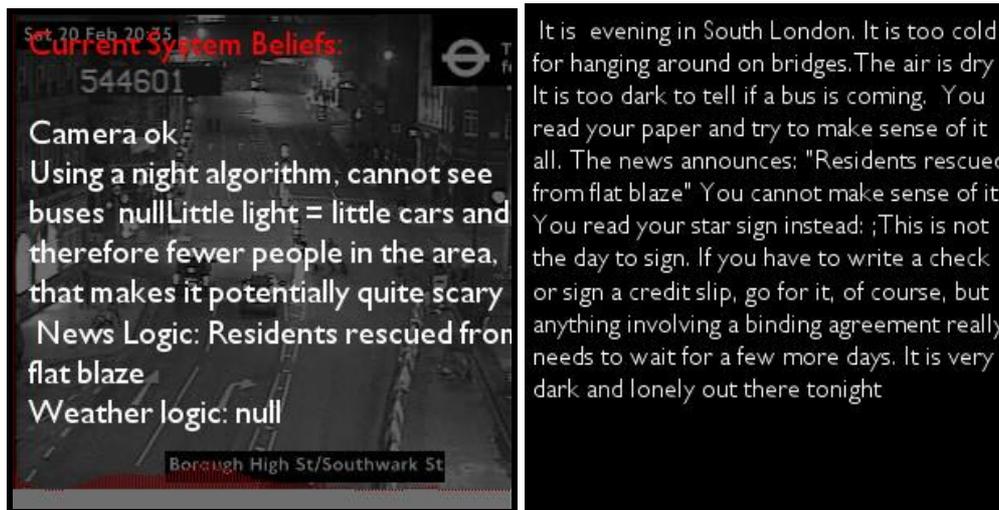
    int cc = grab.pixels[PApplet.parseInt(i)];

    float rc = red(cc); //Get the red value of pixel array
    float gc = green(cc);
    float bc = blue(cc);

    if ((rc >= 206) && (gc <= 169) && (bc <= 204)) {
        /*works on daytime CCTV of Borough, my birth place */
        fill(255, 0, 0);

        rede2 += 20;
        redd = rede2;
    }
}
}

```



My practice engineers, where possible, an end to representing 'while escaping representation'. An end, for example, to the power of CCTV cameras to escape such representation. Throughout the *South* software CCTV cameras and images act as proxy narrators (or narrative agents) bringing to the surface a range of desires, beliefs, agendas and motivations, factors that are suppressed in Western scientism and scientific notions of observer neutrality. Through the *South* software institutional CCTV images are deployed as story-telling mechanisms; this is not represented as a novel form of use for such cameras but their typically concealed métier.

Haraway's application of both human and technological vision as a central metaphor in her notion of *situated knowledges* has pragmatic resonance with the *South* system, in which I attempt to pursue new forms of knowledge production through an epistemology that is embodied, non-neutral and always engaged with a view *from somewhere*. Haraway writes:

all eyes, including our own organic ones, are active perceptual systems, building in translations and specific ways of seeing, that is, ways of life. There is no unmediated photograph or passive camera obscura in scientific accounts of bodies and machines; there are only highly specific visual

possibilities, each with a wonderfully detailed, active, partial way of organizing worlds.

(190).

Within the *South* system the overt deployment of CCTV cameras as narrative conduits is a form of both situated story telling and subjectification. The mechanisms I have designed within this system negotiate and test new forms of objectivity while exploring subjective and inter-subjective responses to test materials: news headlines, CCTV and other images, smells, sounds and tactile experiences. By asking readers to locate and test their subjective responses against those of other readers (via reader contributed content in the *South* book) and also against established epistemologies (such as propositional knowledge in the form of personality types), readers may generate the forms of partial knowledge described by Haraway as 'situated'. These mechanisms form an attempt to deploy a creative form of successor objectivity, the result, in literary terms, is an artefact and a process that generates multiple, concurrent threads of partial and locatable knowledges. As I have stated before, this is not to be confused with a relativist project. A relativist account according to Haraway is 'a way of being nowhere while claiming to be everywhere equally, the 'equality' of positions is a denial of responsibility and critical enquiry' (191). Haraway firmly states that relativism is also a denial of specificity, mirrored in its supposedly diametric construction, the authoritative, totalising claims of positivist science:

Relativism and totalization are both 'god-tricks' promising vision from everywhere and nowhere equally and fully, common myths in rhetorics surrounding Science. But it is precisely in the politics and epistemology of partial perspectives that the possibility of sustained, rational, objective enquiry rests.

(191).

I have pursued a practice in which an alternative form of objectivity is embedded. This objectivity is also connected to the perspective of other people, and is not 'innocent' of its power in creating an evaluatory practice. In response to this realisation I have built in mechanisms to make my partiality as visible as possible within the system, but as Haraway points out:

We are not immediately present to ourselves. Self-knowledge requires a semiotic-material technology linking meanings and bodies. The boys in the human sciences have called this doubt about self-presence the 'death-of-the-subject'. That single ordering point of will and consciousness. That judgement seems bizarre to me. I prefer to call this generative doubt the opening of non-isomorphic subjects, agents, and territories of stories.

(191).

Within the *South* system the apparent isomorphism between one CCTV image and the next is subject to a similar form of generative doubt. The *South* system automatically seeks out differences between images, these differences are interpreted in narrative terms, readers are invited to provide their own interpretation of what these differences mean. Readers are also photographed (subject to their cooperation) and according to data I have uploaded that day, (relating to my own state, a subjective index of mood, reactions, finances and other parameters), these I.D photographs are subject to a range of image processing effects. Images of readers are also overlaid with time-specific data generated in the moments of their interaction with the *South* system. The result is a visual record of readers defined in overtly located and specific terms via my own shifting categories and responses. The fact that my own partiality is literally embedded in these images denies representation without being represented, which Haraway describes as 'the cyclopean self-satiated eye of the master subject' (191).

Figure 40 following page, reader images from the *South* system convoluted with my own image. Temporally specific data is imposed upon the images.



Interactionism

Haraway's outline for a new form of objectivity also addresses the society/individual dualism described by many of the epistemologists I have referred to throughout this thesis. In a psychological context Wendy Hollway (Hollway, 1989) makes the connection between this society/individual schism and the notion of 'interactionism', identifying the 'hopeless dualism' (27) that separates an individual from their society in mainstream social-psychological practices. Interactionism has been used within social psychology to characterise the relationship of the individual to the social, it frames the individual as asocial and 'inevitably reduces to biology and information processing mechanisms' (28), bringing us back to a unitary, innately rational notion of the subject.

Both Haraway and Hollway highlight for me the importance, as both a researcher and practitioner, of not falling in with binary positions in relation to agency, of not placing agency solely in the hands of an individual (and, for example, their biology) or, on the other hand, of characterising agency as a phenomena determined by social forces alone. Rational knowledge according to Haraway is a 'power-sensitive conversation' (Haraway, 1991: 196), a view that envisions science as 'the paradigmatic model not of closure, but of that which is contestable and contested' (196). Likewise Hollway envisages a radically different relationship between researchers, their 'subjects' and the knowledge they generate:

My theorising displaces objective rationality from the centre of the human subject and produces radical possibilities for the use of subjective knowledge.

(Hollway, 1989: 25).

Haraway states firmly that it is not identity however that generates scientific knowledge (or *science* as she puts it), but critical positioning, her alternative form of objectivity: 'A scientific knower seeks the subject position not of identity, but of objectivity; that is, partial connection' (Haraway, 1991: 193). To make claims for knowing the identity of another in its entirety is to enact what Haraway frequently alludes to as the 'god-trick'. My practice is wholly committed to the removal of any such 'god-tricks', despite the arguable presence of such master standpoints within many orthodox computational practices (not to mention psychological assessment methodologies). My own methodology and practice applies a conscious requirement to identify structures and assumptions that rely on the idea of an omniscient, idealised and un-represented, conquering eye. Likewise within the evaluation processes I have used there is an overt indexing to my own perspectives. My aim is to create as high a degree of transparency as possible within the *South* System. The *South* software deploys charts, diagrams and disruptive photographic processes that are designed to locate and embed a critical self-representation.

Haraway's descriptions of an alternative objectivity have been key research references for this project; her notion of a locatable form of rationality is resonant with the *South* project and its software architectures. These architectures are not 'the products of escape and transcendence of limits, i.e. the view from above, but the joining of partial views and halting voices into a collective subject position that promises a vision of the means of ongoing finite embodiment, of living within limits and contradiction, i.e. of views from somewhere' (196). In this vision of collective subject positions the notion of boundaries between objects and subjects becomes far more mutable than in orthodox scientific epistemologies. 'Boundaries' Haraway writes 'are drawn by mapping practices; 'objects' do not pre-exist as such. Objects

are boundary projects' (201). The indices to my own subjective evaluation within the *South* system (produced as instrumental weightings within the software) are also processual in nature and do not exhibit pre-existent states. They are defined by my own mutability and by the mutability of all the parameters within the evaluation processes, as such I would characterise the system as situated, both in the theoretical terms Haraway describes and in Suchman's (1987, 2006) conception of situated systems within computer-human interactions.

Lucy Suchman's work is invaluable in offering both a radical agenda, in terms of key theoretical notions of who systems are designed for (epistemologically), as well as making a profoundly pragmatic contribution to understanding how these theoretical insights can be used within real-world systems. Citing the ideas of Barad and Grosz I will show how I have engaged with my own alternative and pragmatic forms of interactivity, which Barad calls *intra-activity*. This form of interaction is centred upon the notion of situated knowledge expounded by Haraway, but it also places emphasis upon the embodied and processual nature of all interactions, interactions, that, as I will demonstrate, are not predicated on the separation of individuals from society or the separation of mind from body.

5.3 Interactivity and prior systems

Suchman's (1987, 2007) radical reframing of computer-human interaction relates to the degree of pre-existent representation needed for computer systems to work satisfactorily. It is also significant that Suchman, in keeping with the epistemologists I have mentioned in this chapter, emphasises sociality as an alternative to orthodox models of the unitary cogniser (or *cogito*) as the locus of rational actions. Suchman is deeply critical of cognitivist models of interaction that are characterised by information-processing paradigms. These paradigms are predicated on notions of environmental stimulus and behavioural response:

The first premise of cognitive science, therefore, is that people (or “cognizers” of any sort) act on the basis of symbolic representations: a kind of cognitive code, instantiated physically in the brain, on which operations are performed to produce mental states such as “the belief that *p*”, which in turn produce behaviour consistent with those states. (Suchman, 2007: 37).

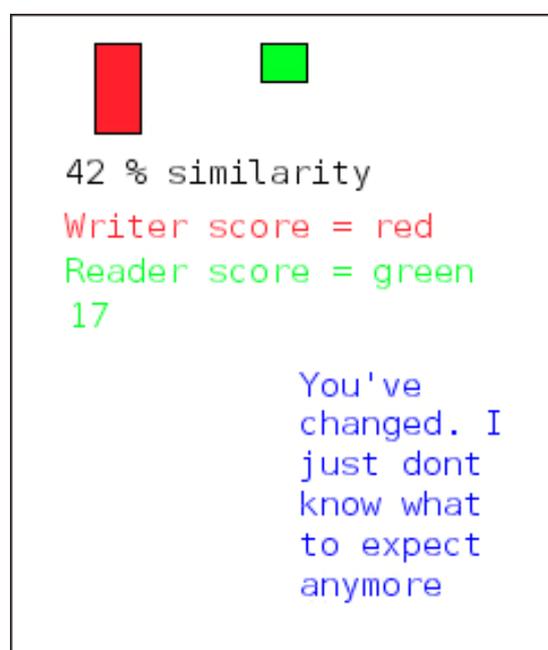
Though there is contention within the domain of cognitive science as to the exact nature of these interactions, there is, according to Suchman, a general belief that this model of intelligent human agency does not merely have a resemblance or resonance with computational processes, but that it ‘literally is computational’ (37). The notion of human intelligence as tantamount to the management of symbolic representations is exemplified in rule-based computation such as expert systems and factory floor robotics. But as Suchman points out, these are narrow domains with a high degree of containment and predictability. As an alternative to the cognitivist emphasis upon the unitary Cartesian *cogito*, (and the specific forms of rationality associated with it) Suchman, like Haraway, suggests that we instead pay attention to the

specificities of knowing subjects, multiply and differentially positioned, and variously engaged in reiterative and transformative activities of collective world-making. (Suchman 2005: 3).

Suchman challenges and inverts the cognitivist idea of similarities between humans and computers and instead asks how we might usefully understand, and instrumentally deploy, the significant differences between machines and people. In part she asserts that the inscrutability of computers is a contributory factor in their reification as entities, rather than as complex arrangements of interacting parts. It is our own projection or ideas of intentionality that sustains the mystique of the computer as somehow personified. This sense of intention, Suchman implies, is part of the mystique of interaction, the idea that we are interacting with an intelligent entity rather than ‘just performing operations on it’ (Suchman, 2007: 42), but in

naturalizing objects as entity-like and intentional there is a danger that their human designers are neutralised.

Figure 41 Below, a screen shot from the *South* software. Where possible the *South* system makes its embedded perspectives visible. The differences between the reader's and my own perspectives are used as a creative weighting within the system. The software can access a simplified mathematical model of my moods and attitudes. This model is compared against the attitudes and moods of each user. The model is regularly updated and accessed by the system online.



Removing the designer from view is very much in keeping with a scientific orthodoxy that seeks to neutralise the scientist or, indeed, to make him or her entirely invisible. My software does the opposite, my presence as an artist and software writer is overtly embedded within and throughout the *South* system. As a subject I am also arguably objectified: my practices, opinions and methods are commodified within the data structures and processes of my own software. Suchman places particular importance upon recognising these forms of boundary crossings, of

the ways in which it matters when things travel across the human-artefact boundary, when objects are subjectified (e.g., machines made not actants but actors) and subjects objectified.

(270).

But in recognising these border crossings it is important not to establish further dualisms and monolithic conceptions of agency in the machine-human nexus. My practice has been informed by conceptions of agency and epistemology that are characterised above all by fluidity. These conceptions emphasise the processual rather than the more fixed territory of pre-given concepts.

Idealised states and concrete circumstances

One particularly rigid concept of interactivity identified by Suchman is that of real-time control over the computing process, in which 'the user can override and modify operations in progress' (Suchman, 1987: 11). Suchman asks what other means of interaction can be instituted and what other notions of agency can instantiate these interactions. Suchman pinpoints language, or dialogic metaphors of interaction, as representing conventionally idealised forms of computer-human communication. This paradigm of verbal communication as the ideal model for interaction between computers and individuals has in large part been canonised by the Turing test. The Turing test posits that if a human and a machine can generate the same verbal responses in reaction to the same stimuli, then 'regardless of the identity of their operations, one processor is essentially equivalent to the other' (22). But Suchman (1987, 2007), Barad (2007), Hayles (1999) and Alison Adam (1998) (among others) deploy theories of embodiment and specificity to present a coherent challenge to this canonical form, not least of all, as I have shown, to that of the disembodied information-processing paradigm which arguably corresponds to the Cartesian *Cogito*. The Turing test, like the forms of rationality affiliated to the *Cogito*, has no interest in 'bodily competences' (Adam, 1998: 183); it deals only with symbolic representations. Continuing with the example of speech, Suchman challenges

another canonised model of interaction design: that of means-end strategies or planning models. The idealised states represented by planning models, such as expert systems and task specific robotics, are the target of consistent challenges, not only by Suchman, but also by the writers cited in the previous paragraph.

The infinitely complex, unpredictable contingencies of real-world environments are far harder to plan for, it is these situations that new paradigms of interactivity address. Taking the example of speech, Suchman argues that plans and goals 'do not provide a solution' (Suchman, 1987: 47), in fact, she argues, they may do the opposite. The degree of *a priori* structures in any interactive system is an indication, in Suchman's terms, of a system's limitation and inflexibility:

The dependency of significance on a particular context, every particular context's open-endedness, and the essential *ad hoc*ness of contextual elaboration are resources for practical affairs, but perplexities for a science of human action...it is an intractable problem for projects that rest on providing in advance for the significance of canonical descriptions – such as instructions – for situated action.

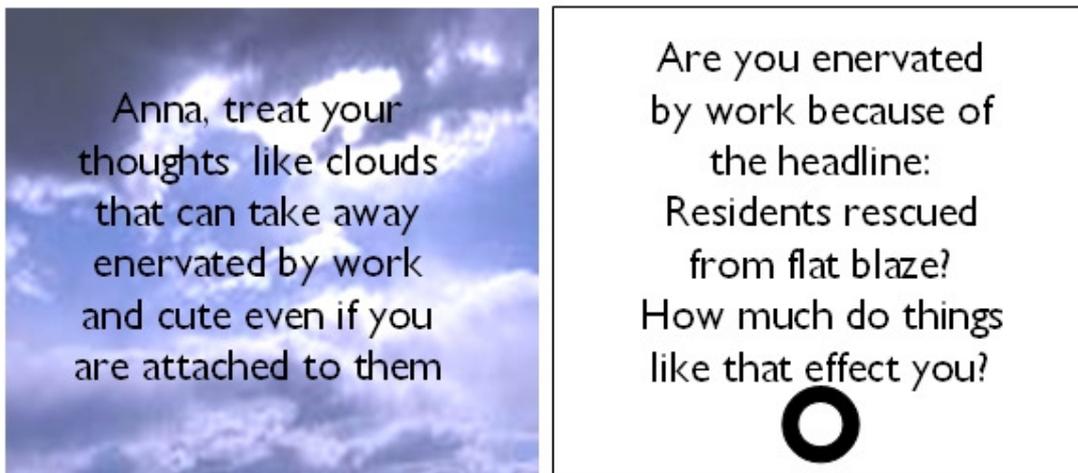
(48).

Suchman's central image (or metaphorical alternative) to *a priori* planning is embodied by the mode of navigation deployed by South Pacific Trukese sailors⁵⁰, in which actions are taken in response to material and concrete circumstances and 'plans are subsumed by the larger problems of situated action' (50). Suchman is not suggesting an end to all forms of planning, but is instead emphasising that it is crucial to respond dynamically to unfolding situations. Suchman's point is that in complex real-world circumstances other forms of knowledge come into play, for example embodied forms of knowledge that are not easily represented in predicate calculus or propositional logic schemas. Suchman cites language as a form of situated action, as having an 'essentially indexical relationship to the embedding world' (60). To construct an interactive system that understands language requires not only an

⁵⁰ PacificTrukese sailors use situated environmental data to make fluid and contingent choices while navigating their small vessels between pacific islands. Lucy Suchman (1987) contrasts this approach to Western navigators who rely on rigidly planned goals that are pursued step by step, without recourse to fluid, extemporised choices made in relation to waves, winds, and other environmental factors.

understanding of the specific situation in which that language is being generated, but also an infinite understanding of the underlying assumptions behind that language but not embedded, semantically within it. There are, unfortunately, no usefully invariant structures available to me as the originator of a largely language-based interactive system. Instead I have looked to the situated processes and *ad hoc* contexts of meaning-making, rather than altogether *a priori* structures or an infinite regress of rules or predetermined outcomes. I have, to a large extent, relied upon building a system that makes interpretation and significant language generation a joint endeavour (but this is not, I would like to emphasise, an ‘innocent’ negation of my own partial perspective within the *South* system). The task of interpretation is (albeit unevenly) distributed between myself and my ‘readers’ and the analytic properties of my software. I assign this aspect of the software a high degree of agency by virtue of the fact that, although written by me, it has a pattern finding ability that, in many circumstances, vastly surpasses my own. The *South* software can rapidly analyse texts, compare content numerically (for example it counts the number of words used by users and compares their verbosity to my own) and it makes an ongoing quantitative assessment of readers which is compared to its numeric assessment of my own psychometric scores. However, the *understanding* that the computer is capable of is far from symmetrical with a human understanding of language, this asymmetry is an unconcealed, and I hope, a creatively energising, artefact of the *South* system.

Figure 42 Below, content generated by the *South* software, misunderstandings between the computer and the user are used as a resource within the *South* system. They are a source of creative tension and a tool for investigating the differences between people and computers as well inter-subjective differences of meaning.



Questions of agency logically arise when orthodox notions of knowledge generation are confronted. Alison Adam (1998) asks, what types of knowledge are denied by the conceptualisation of knowing as a symbolic representation within traditional AI. Adam writes of 'epistemic hierarchies' (Adam, 1998) that privilege propositional knowledge but denies or negates, other, typically less formalised, forms of knowing such as tacit or skills based knowledge. These other types of knowing are not separable from the experience of being embodied, as Adam writes:

Rationalist philosophy has sidelined the body in giving the mind the primary role in the making of knowledge and rationality.

(129).

Adam, like Hollway (1989, 1984) and Haraway (1991) asks what social constructionism can tell us about physical embodiment, and concludes that it is not sufficient to explain our embodied selves as the sum total of discourses. This is no more satisfactory an explanation than socio-biologically reductive accounts such as those proposed by Edward O. Wilson (1975), in which all social behaviour is characterised as driven by evolutionary imperatives. Likewise traditional AI cannot satisfactorily account for the processes that make symbolic representations meaningful. What is missing from these epistemic schemas is a holistic account of what Haraway (1991) calls the 'material-semiotic', in other words a non-dualistic description of the processes through which meaning is generated.

Agency in computer-human interactions

The philosopher Karen Barad (2007) expands upon Haraway's notion of the *material-semiotic* with her conception of *agential-realism*, in which meaning is constituted from specific situations and actions or causal *intra-actions*. These intra-actions are socio-material; they are not separable from society and its discourses or from physical materialities. Barad's agential realism does not emanate from one location or from exclusively human sources, neither is it located in words alone. Barad's notion of 'performative' understanding (explained below, but essentially a form of meaning-making rooted in events, practices and real-world actions) branches away from forms of representation that place us outside of the world, it places us firmly as part

of the 'world in which we have our being' (Barad, 2007: 133). According to Barad, *intra-action*, unlike *interaction* does not presuppose 'the prior existence of independent entities of relata' (139). Barad does not take for granted atomistic or Cartesian separations between subject and object; instead she sees specific situations and actions as allowing phenomenological relata to emerge as specific causal intra-actions.

The notion of *entanglement* is central to Barad's distinction between *intra* and *interaction*, and the distinction between objects that are separable, and phenomena, which are inherently more fluid. *Performative understanding* is Barad's central challenge to the power we have placed in language as tantamount to reality, as the main agent in systems of representation. Discourse, Barad writes 'is not what is said, it is that what constrains and enables what can be said'. (146) Performative understanding defies the anthropocentric forces, 'the seductive nucleus' (135) which Barad describes as binding us to our anthropocentric theories. Barad's agential realism specifically acknowledges and takes account of 'matter's dynamism' (135). This approach is an opportunity to move away from the infinite regress of epistemological self-reflection and representation, to forms of knowing and knowledge generation that are rooted in practices and real-world actions, as such it has made a significant contribution to resolving a number of the problems raised throughout this chapter, not least in the idea of an alternative epistemology, a form of mutually constituted meaning that is not fixed but ongoing and multiply enacted.

Suchman also identifies the significance of Barad's new conceptions of agency in relation to interactive system design:

This intimate co-constitution of configured materialities with configuring agencies clearly implies a very different understanding of the human-machine interface.

(Suchman, 2007: 26).

This arguably brings us back to Suchman's question of the degree of difference between humans and machines, and the reification of computers as intentional entities. There *are* differences between machines and people but in identifying these differences one must not lose sight of their (and our) mutual constitution. However,

Suchman is anxious to point out that it is not necessarily a symmetrical process of constitution. Machines and humans do have significant differences but they do not negate critical and non-humanist conceptions of agency. Suchman reminds us of the need to examine the new meanings that occur in the dynamic transformations of material-discursive practices, for this dynamism, as Barad points out, *is* agency. It is an agency that is present in 'the ongoing reconfigurings of the world' (Barad, 2007: 141).

Though Barad does not mention either Henri Bergson or Elizabeth Grosz it would seem that she is describing a processual and material form of becoming that has many similarities with Bergsonian philosophy and with the ideas of Grosz (1994, 1999, 2004), especially those concerning embodiment and epistemology. These accounts of knowledge production present radically different paradigms of inquiry that have aided me in developing a reflexive and situated form of creative practice.

Embodiment and the generation of meaning

Elizabeth Grosz (1994) re-orientates subjectivity to the body, but this is not to frame the body as a-historical or pre-cultural, neither does Grosz adhere to holistic, transcendental, or what might be termed 'new-age', ideas of mind-body cohesion. Grosz frames notions of seeking mind-body cohesion as reliant upon a problematic binary conception. In Grosz's terms the mind and the body are like a Möbius strip, consisting of neither a dualism nor an identifiable whole. Though the body, in Grosz's terms, is still a social, political and cultural location it is not satisfactorily accounted for in social constructionist discourse, which does not (according to Grosz) see the body beyond fixed and biologically determined parameters. Elizabeth Grosz frames the body, not as an object of representation, but as an entity in an ongoing process of becoming. Grosz supports this claim by exploring a range of so-called psychosomatic and historically specific conditions such as stigmata, phantom limbs and 'hysterical' paralysis, in which culturally perceived notions of paralysis are manifested in the body despite their physiological inaccuracy. Grosz, like Haraway sees the body as:

a point from which to rethink the opposition between the inside and the outside, the private and the public, the self and the other and all other binary pairs associated with the mind/body opposition.

(Grosz, 1994: 21).

Throughout the *South* system I have deployed practices that result in a rethinking of the gradations of relationships between a subject and an object, characterised by Grosz as the reversible positions of subject and object, between, for example, feeling and being felt. My practice has driven a performative exploration of the gradations between being evaluated as a subject and self-observing as a sort of object. Specific examples and exercises involving such self-observations can be found throughout the *South* book and software.

Figure 43 Below, a screenshot from the *South* software, it depicts part of an evaluative process in which readers connect their subjectivity to site-specific textures, which they must find and experience through touch. This introduces an overtly embodied form of knowing into the epistemic schemas of the *South* project.



A central concept used by Grosz is that of the *body image*, or that which provides us with a sense of ourselves within an environment and our sense of having identifiable body-parts:

The body image is not an isolated image of the body but necessarily involves the relations between the body, the surrounding space, other objects and bodies.

(85).

The notion of the body image explains how consciousness can ‘establish a space or a distance between itself and its objects’ (91). Our bodies, according to Grosz, are defined by their relations to the environment, but also define the environment. It is an interchange highly reminiscent of Barad’s agential realism and differential intelligibility, but also of Haraway’s notion of the material-semiotic.

Once the subject is no longer seen as an ideality – whether psychical or corporeal – but fundamentally an effect of the pure difference that constitutes all models of materiality, new terms need to be sought by which to think this affinity within and outside the subject.

(209).

The need for such new understanding of the differences between elements is present in the writings I have cited of Bergson, Barad, Suchman and Grosz. All these writers point to the need for systems that have a high degree of contingency and openness in their generation of meaning, as I have shown (and will continue to show throughout this thesis) my practice has led me to explore contingent and open structures within the *South* system. Beyond the narrow domain of interactive systems, these writers are proposing alternative ways of knowing and of creative becoming that threaten dominant epistemological and subjective schemas. The schemas they challenge are wholly pre-determined, statistical, quantifying, fixed in reactive patterns of cause and effect. It is these schemas that I have sought alternatives to and will now describe in greater detail, also exploring work by other artists and writers whose creative interests intersect with my own.

5.4: Flexible data structures and flexible subjects: designing the *South* system

Each time I recall fragment 91 of Heraclitus, "You cannot step into the same river twice", I admire his dialectical skill, for the facility with which we accept the first meaning ("The river is another") covertly imposes upon us the second meaning ("I am another") and gives us the illusion of having invented it .

(Borges, 1999: 323).

Isabelle Stengers asks, "What kind of practices do we create when we use the concept of subjectivity?" (Stengers 2008: 14). In a similar way questions of how computational works can engage with subjectivities are also embedded within the specific form of my own practice. How can this be done in previously unexplored forms? What kinds of systems will result? I would like to frame the results of my research and practice around subjectivity as a series of cultural and pragmatic proposals. These proposals are embedded within my work, within the *South* system and within both the *South* egg and book. These three artefacts may be framed as test sites in which the ideas generated by my research and practice can be pragmatically evaluated in 'real-world' situations with 'real-world' readers.

The rationale for the artefacts I have designed stem from my core findings, which are as follows:

- Meaning (or intelligibility) in a situated system will not reside in an *a priori* model of the user (or their possible interactions), but rather in a relation between more generalised plans and specific circumstances.
- Likewise subjective representation is problematic, it is more useful to examine dynamic and situated differences.

- Dominant modes of knowledge production such as those based on propositional logic, statistics and *a priori* notions of cause and effect (exemplified in rule-based systems) are fixed and reactive and as such are not ideal for generating new ideas or new texts. These forms also negate other types of knowledge, such as embodied, skills based, knowledge.
- Open-ended methods are preferable within a system designed to encourage divergent forms of writing and divergent subjectivities.
- The writings the system generates will, like the subjects who interact with them, be multiple, situated and multi-linear.
- Where possible, my own partial perspective should be transparently present within the system, not negated or hidden by it.
- The system should deploy knowledge generated through embodied processes, not only sight, but also smell, touch, taste and sound.

From these core findings I can encapsulate my theoretical and practical rationale into the following two statements:

- Interaction is a contingent process of shared and collaborative, *ad hoc*, understandings within the framework of generalised or more abstracted *a priori* intentions.
- Difference and specificity are key resources in an interactive system working with subjectivities.

The *South* system is an appeal to tolerance of complexity and the assumption that readers are intelligent, contradictory and multifaceted. Creating language-based computer systems highlights the complexity of human language and also highlights the limitations in understanding currently inherent in computational systems. A key finding of my research is that the asymmetry of understanding between humans and computers can be framed as either a source of failure or a source of creative tension. Language-based interaction is most conducive to failure in cases where *a*

priori meanings are deeply embedded, precluding a dynamic understanding of situating circumstances and actions. Giving computational systems extended access to such situating material is a core concern of my practice. To quote Suchman, situated interaction is characterised as 'lively, moment-by-moment assessment of the significance of particular circumstances' (Suchman 2007: 176). My practice deploys subjectivity and subjectifying practices as a form of situating resource or an expanded notion of an 'environment', but the fixed models of the subject present in the system (generated by schematised subjectifying practices) are designed to be decomposed and renegotiated by readers.

Rivers of meaning: ArrayLists

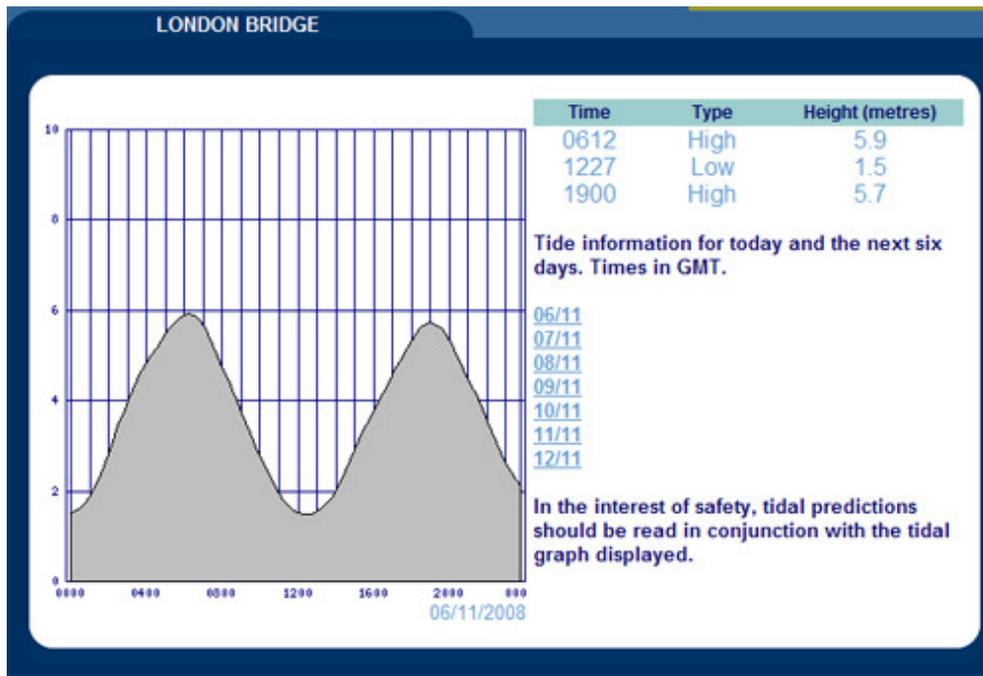
The river is a structure that retains its riverine identity *because* it is always changing; if it did not change constantly it would not and could not be a river. The *South* system emulates the form of a river and applies its flexible formations to the construction of subjectivity. Clare Colebrook in Grosz (1999) proposes a similarly flexible and processual approach to subjectivity. Colebrook describes Foucault's so-called *games of truth* around subjectivity as a 'transvaluation of philosophy's own order: the self is produced in the inquiry it makes into itself' (128). This is characterised as a reactive strategy. Colebrook posits instead a non-reactive approach that would 'affirm itself through the questions it asks about itself – not in passive recognition but through self-formation' (128-129). This is close to the strategy I have adopted in designing the subjectifying processes deployed throughout the *South* system. Readers are invited to observe themselves in their own processes of self-evaluation and of evaluation by the system. In this way layers of subjectivity are generated, but they are, like Heraclitus's river (cited in Borges, 1993: 323), never encountered more than once. The *South* system is embedded with flux, the networked or relational flux of subjectification and of situating circumstances, including the tidal transmutations of the River Thames itself. Arguably, the system is unable to generate immutable results. It is a network of meaning that is highly unlikely to repeat itself precisely. Though the system draws upon tide tables (tidal data is obtained by the system through a feed from the BBC Weather Centre), this

data is used to define, for example, the weight and range of the system's core vocabulary). These predictions are themselves subject to a significant degree of flux, caused by the raising of the Thames flood barrier, surface run-off from heavy rains or winds etc.

I have chosen to work with a flow of data that is essentially positioned between chaos and order, in this way I might define the *South* system as having, what, in Deleuzian terms, might be described as *diagrammatic*⁵¹ qualities. Such qualities are contingent, nascent or diagrammatic. These are the conditions that Gilles Deleuze (1981) describes as being necessary for generating the new, his description is highly resonant of a river, 'The diagram is indeed a chaos, a catastrophe, but it is also a germ of rhythm. It is a violent chaos in relation to the figurative givens' (Deleuze, 1981: 72).

Figure 44 following page, tidal predictions for London Bridge, obtained from the BBC Weather Centre, 06/11/08, available at: <http://www.bbc.co.uk/weather/coast/tides/tides.shtml?date=20081106&loc=0113>, accessed 06/11/08

⁵¹ Deleuze's notion of *the diagrammatic* (or *the graph*) was influenced by the logician and semiotician C. S. Peirce (1839 – 1914) who developed a graphical syntax for logical graphs. Deleuze augmented, or indeed transmuted Peirce's ideas by ascribing a far greater degree of contingency and chance to diagrammatic processes. The diagram in Deleuzian terms is an event not a representation. It facilitates (particularly in regard to painters) a means of navigation through chaos.



The metaphor of tidal prediction is an apt one in light of my interest in the efficacy of planning and rigidly *a priori* systems. Suchman's ideas (1987, 2007) have been useful in reflecting upon aspects of my own work. Suchman's metaphors around planning and embodied interaction often allude to moving through water, including the navigational techniques of Trukese sailors and the image of a white water canoeist manoeuvring through rapids. Unlike Suchman, however, my primary concern is not with the design of a user interface or the effectiveness of its instructions (she cites the example of an interface for a photo-copier machine) but with a dynamic and situated software and analogue system for the generation of text and performative experiences. Despite these differences in intention, Suchman's ideas of situated action have provided pragmatic examples of ways in which one might approach *ad hoc* text generation, and the creation of a system that has a minimal dependence upon a detailed and prior set of rules.

Figure 45 Below, an algorithm from the *South* software, words are fed into the system according to the height of the Thames at London Bridge.

```
/**
 * action()
 * shuffle amount of words defined by the Tide height
 *
 * @param int ab
 * @return String
 */

public String action(int ab) {

    Collections.shuffle(Arrays.asList(act_verb));
    for (int i = 0; i < act_verb.length; i++) {
        String a = act_verb[ab];

    }

    String a = join(act_verb, " ");

    String listspli[] = split(a, " ");

    return listspli[ab];

}
```

The *South* system has deployed some of the more conventional strategies described by Suchman (2007), such as obtaining a local and a global picture of user interactions. However, this does involve the analysis of specific tasks undertaken by a reader (such as their written reaction to a ‘live’ CCTV image), and an accumulating analysis of their general actions and responses, *with direct relation to situating and locating*

factors. More radically, I take on board Suchman's notion of plans as resources for action rather than as controlling systems. These plans are loose and sketch-like, they represent abstracted generalisations for the sort of situated actions that will work in conjunction with them. As Suchman writes, 'the detail of intent and action must be contingent on the circumstantial and interactional particulars of actual situations' (Suchman, 2007: 183). The vague representation implicit in such plans is complemented by situated actions that, although destined to be concrete and specific, cannot be fully represented in an *a priori* model. As ever Suchman finds analogies in human language, 'in its efficiency', Suchman writes, 'language provides us with a shareable resource for talk about the world' (183). But in citing language as an example, Suchman is not resorting to the problematic ideal of language as a model for computer-human interaction, but rather, looking at the use of language as an *a priori* structure that works effectively in conjunction with unpredictable circumstances:

By abstracting uniformities across situations plans allow us to bring past experience and projected outcomes to bear on our present actions.

(184)

Suchman describes the way in which *a priori* formulations are deployed in tandem with unplanned circumstances and practices; her example of Pacific navigators (discussed earlier in this chapter) is an apposite paradigm. The archetype of water and navigation has also emerged within my own practice as an instrumental form. As my work is centred on the South Bank and the river Thames it was perhaps inevitable that riverine and liquid structures would materialise from it. Suchman cites Edward Hutchins⁵² (1983), in which the situated nature of Micronesian maritime navigation is described. The type of navigation Hutchins delineates uses both the familiar observational techniques of celestial navigation, but also takes cues from a range of environmental referents, such as the shape and colour of waves, clouds,

⁵² Edward Hutchins (1983), 'Understanding Micronesian Navigation'. In D.Gertner and A. Stevens (eds) *Mental Models* (pp. 191-255) Hillside, N.J, Erlbaum.

birds and other local, yet unplanned interactions. This process is characterised by Suchman as ‘interaction between a representation and the particular, contingent details of the environment’ (185). Within my own practice it is this type of interaction that represents a significant break from previous notions of interactivity. In the context of a narrative generation system, (combined with the notion of subjective or psychometric assessment) my aim has been to create a radically contingent form of software that has a dynamic relationship to generalised goals. My software architecture has used mutable structures such as ArrayLists, a data structure in the Java programming language that can expand and contract to reflect ad hoc changes. ArrayLists are particularly flexible in allowing for duplicates and in having a potentially limitless capacity (subject to the power of the computer being used). Unlike a database structure, I distinguish the ArrayList for not relying upon a body of meta-data or a complex relation of further taxonomic structures.⁵³ The data these ArrayLists accommodates consists of contingent variables such as news headlines, tidal highs and lows, weather and financial information and reader responses to embodied encounters within the South Bank area. These types of information work in the same way that Micronesian navigators use environmental referents, they are navigational resources, not for a user navigating an ‘interface’ but for a system configuring itself in reaction to unique circumstances that cannot be embedded as rigidly prior structures or rule sets alone.

The narrative landscape: Jeffrey Shaw, Mongrel and Martin Crimp

In researching alternatives to rigidly determined forms of both subjectivity and interactivity I have examined the work of other artists who share these concerns. In terms of interactivity the artists whose work has most in common with my own goals are not primarily concerned with interactive narrative generation but with an embodied and often spatial form of interplay closer to gaming or site-specific art. Jeffrey Shaw’s *The Legible City* (1989) and *The Narrative Landscape* (1985) are both eloquent examples of works that provide important frames of reference for my own

⁵³ Using an inheritance hierarchy (arguably of course another form of complex structure), ArrayLists can hold a diverse range of tailor-made objects that can be fluidly transmuted.

practice. *The Legible City* is concerned with an embodied form of interactivity in which specific locations can be explored virtually by the action of cycling. Shaw's audiences navigate city environments such as Manhattan (1989), Amsterdam (1990) and Karlsruhe (1991), which are constructed from three-dimensional texts instead of buildings. Like many hypertext narratives the audience can follow their own pathway through each city, following pre-determined texts⁵⁴. The resulting work generates an embodied but deterministic form of narrative experience. Likewise Shaw's *Narrative Landscape* (1985) involves the navigation by joystick of pre-determined but multi-linear layers of visual and written digital artefacts. Where Shaw's work enters interesting new realms of interactivity is when he allows for inter-subjective exchanges. *The Distributed Legible City* (1998) is a networked installation in which multiple users cycle through virtual cities, these users may be at different physical locations but are brought together virtually. In *The Distributed Legible City* audience or rather *participant* conversations and physical gestures augment pre-determined narratives. *The Distributed Legible City* represents a work that is far closer theoretically and pragmatically to the *South* project than Shaw's earlier works.

Mark B. Hansen has written at length about Jeffrey Shaw's work, framing it in the context of his thesis or 'Bergsonian vocation of new media art' (Hansen, 2004: 12), in pursuit of which Hansen asks:

First: how the image comes to encompass the entire process of its own embodied formation or creation, what I shall call the digital image. Second: how the body acquires a newly specified function within the regime of the digital image. And third: how this function of the body gives rise to an affective "supplement" to the act of perceiving the image, that is, a properly haptic domain of sensation and, specifically, the sensory experience of the "warped space" of the body itself (12).

⁵⁴ Presumably Shaw's bicycle riders can also fragment those texts by navigating their own 'wrong' route, away from Shaw's intended narrative structures?

Though the *South* software also deploys images as epistemic artefacts or indeed *agential* presences, (such as CCTV pictures and reader ‘mug shots’) the *South* book and software also makes similar investigations into digital and analogue texts, asking how they might come to encompass embodied processes of generation. The *South* project is similarly concerned with visceral forms of knowing and with alternatives to orthodox computational representations such as knowledge bases or ontologies.

Hansen also writes about another work that is overtly concerned with rigid *a priori* representations and clearly shares an interest in critiquing subjectifying practices. *Colour Separation* (1998) by the art group *Mongrel* deploys the inter-subjective relationships of its own members as a resource and reference point to construct eight rigidly schematised racial typologies. The work was distributed as *Heritage Gold* software, arguably critiquing the concept of both heritage and the commodification and classification of identity. Similar critiques are found in digital works such as Diller and Scofidio’s *Indigestion* (1995), an interactive video in which viewers were able to choose from various stereotypical character traits to construct the two dining characters. This work aimed to expose the ‘rhetoric of choice surrounding interactive technologies and at individual choice in relation to the cultural construction of sexual and class distinctions’ (Graham, 1996: 32). Likewise Graham Harwood’s interactive installation, *Rehearsal of Memory* (1995), constructed an amalgam, visual identity from the collective identities of prisoner-patients in the Ashworth Mental Hospital. *Rehearsal of Memory* plays upon the subjective reductions such patients are defined by, in which they are pathologised as categorisations that describe behaviours and medical conditions but tell you little or nothing about their memories and lives.

Dramatic categorizations

The critique of subjective categorisations embedded in my practice also has themes in common with the work of the playwright Martin Crimp, typified in *Attempts on Her Life* (first performed in 1997), and *No One Sees the Video* (first performed in 1990). In light of my own experience it is interesting to note that Martin Crimp worked as a transcriber of market research interviews between 1980 and 1983, chronologically

close to my own initiation into the practices of market research⁵⁵. *No One Sees the Video* presents market research as a 'parasitic activity that is at best of questionable value and at worst positively intrusive' (Sierz, 2006: 33). Martin Crimp describes his play as a 'post-consumer play, dealing with the idea that markets and aspects of business are like the air you breathe' (34). The play can be viewed as an attack on the naturalisation of evaluative practices and intrusions. Aleks Sierz writes: 'These question-and-answer techniques, so suggestive of police interrogation, give the play an air of manipulative power games with uncertain outcomes' (33-34). This statement might also represent the *South* system, which invites its readers to enact their own processes of manipulation and self-representation. As Martin Crimp demonstrates in the play, the processes of subjection do not affect the 'subjects' alone:

Crimp is also interested in the way the job affects its employees. "There is a line in it," Crimp said, "where the man [Colin] is trying to persuade the woman [Liz] to take a job in Market Research and he says, "just acquaint yourself with the vocabulary and the rest will follow" [p.45], Once you have acquired the tools, then that becomes set in your mind and you behave in a certain way.

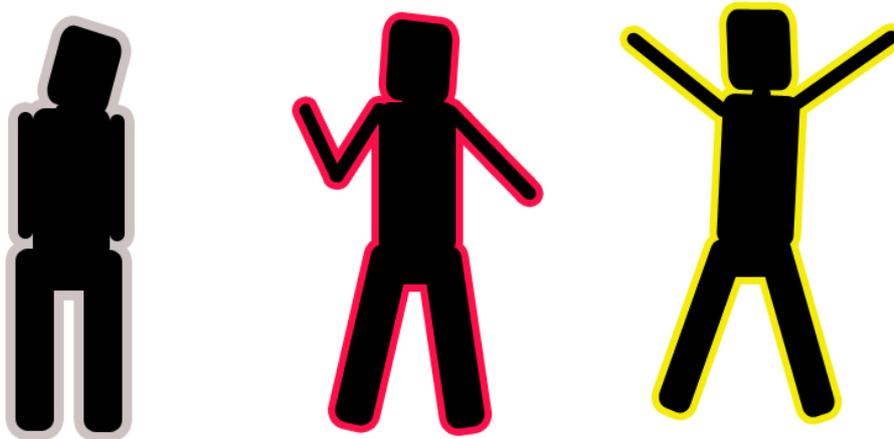
(33)

In manipulating and assessing my own readers one might ask what type of subjective transformation I am affecting upon myself. As Martin Crimp's character Colin says, 'I'll tell you something: we all turn, Jo, into the kind of people we used to despise' (33). In a more positive light this may be rephrased as recognition of the *participant observer* and perhaps an inversion or variation upon the *experimenter effect* (in which the subjectivity of an experimenter effects the outcome of an experiment), one might rephrase it as a form of feedback loop in which the experimental methodology and its outcomes cumulatively re-effects or re-inculcates the experimenter. To

⁵⁵ The era is significant, characterised as one in which materialism and notions of consumer choice, came to the forefront. Aleks Sierz observes 'Crimp was clearly aware that the social and political climate was one in which most people naturally equated happiness with commodities' (Sierz, 2006: 34). Crimp's other play *Dealing With Claire* (1988) also addresses the specific financial practices of that time, such as 'gazumping', in which a house seller would accept a higher price offer for their property even though they had verbally accepted an earlier offer from another buyer, at a lower price.

quote Claire Colebrook again, in Foucauldian terms ‘the self is produced in the inquiry it makes into itself’ (Grosz, 1999: 128), but, according to Colebrook, a less reactive self-position is possible, in which ‘the self it effects is not an essence but an event’ (132). This is a processual notion of the self, a mutable, nomadic assemblage who is invited to engage with and move throughout the *South* system, which is itself an assemblage, an event as much as, if not more than, a digital artefact or a set of encoded and prior structures.

Figure 46 Below, readers construct icons to represent themselves visually to the system, these images are then embedded in the egg device and in future analogue versions of the *South* book.



5.5 Conclusions

This chapter has shown how new accounts of epistemic processes and new ideas of the subject have the potential to rejuvenate interactive narrative practices. Specifically, my research into subjectivity and subjectifying practices has opened up new possibilities for the design of computational systems interested in the specificity of interactions and interacting subjects. Throughout this chapter I have sought to

rationalise my response to this research and to describe the outcomes of that research in relation to my own project and practices. These outcomes can be summarised in the following statements:

- The *South* software and book frames subjective evaluation as a form of mutable, multi-linear fiction and performance.
- The software I have developed deploys 'live' CCTV images as narrative agents. These images are both distributed (as part of a city-wide traffic camera system) and subject specific, 'shooting' the interacting subject at the time of contact.
- Aspects of my own subjective and partial perspective are iteratively and longitudinally embedded into both the analogue and digital *South* systems.
- Subjective *self-embedding* is part of both an ethical commitment to transparency and a pragmatic re-conceptualisation of subjectivity and partiality as a creative resource.
- The *South* software and book uses generalised goals to work with specific, dynamically acquired, narrative materials and circumstances.
- The material is designed to evolve. As a corpus it is continually analysed by the system, the results influence facets of subsequent content generation. In this way the project content is both singular and collective.

These statements may be further summarised as taking aspects of interactivity and scientism that have been historically defined as problematic, such as the gaps in understanding between machines and people, the *experimenter effect* (and other

subjective positions encroaching upon an idealised notion of neutrality), and transmuting them into creative resources. This is an original contribution to the development of interactive fictions and to a form of game play that uses real life situations, subjects and locations to augment, or, perhaps more strongly, to define and to situate digital works.

Many of the works I have cited (as well as aspects of my own work) share similarities to games as well as to fictions. These works also often have a clear provenance in the hypertext fictions that emerged from the late 1980s onwards and to early ideas about artificial intelligence, narrative and agency. The next chapter will expand upon these similarities, looking at early forms of text adventures and also at works that have used conversational software agents or *chatbots*, both as dramatic protagonists and as forms of user interface. In relation to my own practice the following chapter will examine my initial attempts to create a conversationally-based work using a software agent. It will describe the rationale for the choices I have made in pursuing that practice, as well as my reasons for rejecting the *chatbot* form in favour of more situated networks of agents. The chapter will also look at the historical provenance of artificial agents and of their wider conceptual presence in our culture, often as forms of servant, replicating historically problematic ideas of masters and slaves.

Chapter 6

Chatbots, Agents and Agency



Figure 47 Above, toy robot, collection of E. Dare.

The *South* system is able to situate itself contextually through the deployment of several software agents. These agents expand the agencies at play within the computer-human relationships forged through engagement with *South*⁵⁶, opening the system to ‘live’ surveillance images, meteorological, financial, and other dynamic forces. This chapter will explain how and why I have used agents within my work, placing them in a historical and cultural context and highlighting the key issues I have had to negotiate in utilising them. The use of agents has supported the fundamental themes of my PhD practice and thesis; these are themes of subjectivity, epistemology and agency. This chapter will show how and why agents and agency relate to my core concerns, explaining the rationale for pursuing specific practices and theoretical issues, and reporting my key outcomes and inferences.

Agent technology, like the concept of agency, is a complex, contested and multi-disciplinary field. Alison Adam (1998) is at pains to point out that the overlap of

⁵⁶ To recap, *South* is the broad heading for the three key components of this project, the digital interface, the analogue book and the egg device that forms a bridge between the previous two domains.

disciplines, in particular sociological and anthropological models overlapping with the domain of artificial intelligence has led to problematic simplifications and unexamined assumptions about agency, particularly in regard to the notion of intentionality and knowledge generation. Adam writes, 'AI's focus on individual knowing, on intelligent agents whose minds operate by reasoning with symbolic representations, tends to deflect the possibility that cultural concerns might affect their ways of knowing and operating in the world' (Adam, 1998: 64). Hers is not the only voice suggesting the need for broader epistemological scope within the construction of agents and philosophical conceptions of agency. Sengers and Mateas (2003) also critique the atomistic design of software agents and false assumptions of ideological neutrality in idealised interactive systems.

Sengers and Mateas re-conceptualise AI as 'an expressive medium' (Sengers & Mateas, 2003: 167), in which 'expressive AI conceives of AI systems as cultural artefacts' (167). Sengers and Mateas are core references for this chapter, between them they provide a conception of agent technology that is arguably more useful for artist practitioners, one in which systems are reframed as a performance, within 'a performative space, the system expresses the author's ideas. The system is both a messenger for and a message from the author' (167). In this chapter I will explore this concept and some of the ways in which I concur with and expand upon the notion of agent technology as performative and expressive. Other writers, such as Andrew Leonard (1997), Sarah Kember (2003), Simon Penny (1999) and Joseph Weizenbaum (1976) have also provided constructive critiques of the core assumptions underlying constructions of agents and agency (in the case of Weizenbaum, in relation to the precursors of agents such as *chatbots*). The problems these writers highlight and the alternative structures some of them propose will form the grounding for the first part of this chapter, which is divided into three main sections.

The first section of the chapter will also define some of the key terms I reference and highlight the major technological and philosophical issues I have been confronted with. The second section will investigate the specific ways in which I initially utilised agents,

particularly some of the problems encountered in my first attempt to construct a deliberative⁵⁷ conversational agent. The third section will outline and rationalise my final strategies in constructing an agent-based architecture for *South*. The third section will also look critically at other practitioners and arts projects that have used agent technology; additionally this section includes a user profile, outlining how a real reader experiences the *South* software and its agents.



Figure 48 Above, toy Cyberman, collection of E. Dare.

6.1 Definitions and Critiques of Agents and Agency

An agent is just something that acts (*agent* comes from the Latin *agere*, to do). But computer agents are expected to have other attributes that distinguish them from mere

⁵⁷ *Deliberative* is a term for agents that are embedded with 'beliefs, desires and intentions'.

“programs”, such as operating under autonomous control, perceiving their environment, persisting over a prolonged time period, adapting to change, and being capable of taking on another’s goals. A rational agent is one that acts so as to achieve the best outcome or, when there is uncertainty, the best expected outcome.

(Russell and Norvig, 2003: 4).

The simplest definition of a human agent is someone ‘that acts or exerts power’⁵⁸, an artificial agent, as defined by Răzvan Florian requires ‘mechanisms that allow the agent to sense the environment and act upon it and do not require the intervention of other agents to be executed. A thermostat or a virus can thus be considered an agent’ (Răzvan V. Florian, 2003: 5). But simple definitions of agents and agency as many researchers acknowledge, (including Florian, Russell and Norvig) belie the real difficulties of defining these terms. Computer scientists Mark d’Inverno and Michael Luck (d’Inverno, Luck 2004: 3) acknowledge the complexity, in a computational context, of making an overarching definition of the term *agent*, and advise individual researchers and practitioners to make their own definitions. Likewise the notion of agency (as this chapter will show), is itself not clear-cut, as indicated in Barad (2007), Slack and Wise (2005), Adam (1998), Hayles (1999), Suchman, (2005) and Haraway (1991), among others cited in this thesis. What a significant number of theorists⁵⁹ and computer scientists do agree upon, however, is that these terms are not neutral and are in fact inherently problematic or ‘fuzzy’.

Aside from problems of meaning there are further issues arising from the characterisations and uses of actual agents, these have been explored in practice and in writing by scientists and artists including Simon Penny (1999), Phoebe Sengers (1998, 2003) Michael Mateas (1997, 2001, 2003) and Joseph Weizenbaum (1976). These issues will be discussed at some length in this section and related to my own practice. Theorists such as Alison Adam and Andrew Leonard highlight the way in

⁵⁸ This definition comes from Merriam-Webster’s online dictionary: available at <http://www.merriam-webster.com/dictionary/agent>, accessed 19/07/09

⁵⁹ Theorisers of agency emanate from fields as diverse as communication and control theory to feminism, social anthropology and computational arts.

which agent technology relates to, and in some cases duplicates, many of the problems inherent in earlier forms of AI. An understanding of these challenging issues and continuities has been an important part of my own approach to deploying agent technology and will be discussed later in this chapter. Slack and Wise (2005) offer a complex characterisation of the term agency that has usefully mirrored some of my own practices. I will begin this section by outlining their definitions.

Defining agency and agents

Slack and Wise in (2005) are at pains to distinguish agency from causality. Causality is characterised by these authors as restricted and one dimensional:

The causal approach has a certain universal undertone to it, meaning that its purported causal effects are assumed to be the same under any-and-every-circumstance. The causal approach cannot adequately grasp the particularities of situations.

(Slack and Wise, 2005: 116).

Instead, Slack and Wise propose a complex view 'that acknowledges the work of articulation' (116). My understanding of the word *articulation* is the recognition and accommodation of the situatedness and relationality of states, a multi-dimensionality that is negated by simplistic delineations of causality. Slack and Wise write:

What makes this approach richer is that it is sensitive to the contingent interplay of a wider variety of factors. To insist that the interplay is contingent is to recognise that culture (or technology) is not a set of stable, unchanging, and fixed categories and components, but rather a set of dynamic, changing, and interrelated connections or relations

(116).

It is therefore a mutable, complex and layered set of relations, which we can associate with a situated and multi-dimensional concept of agency. This definition may be at odds with orthodox conceptions of agency that frame 'it' as a power held by an agent and by implication with a notion of intentionality, in particular, human intention. Slack and Wise (2005), Barad (2007), Braidotti (2006), Kember (2003), Adams (1998) and Suchman (2007), among others, all argue for wider interpretations of agency.

The dictionary definition and popular usage reduces agency to a thing, a possession of an agent, rather than recognizing agency as a process or relationship. We propose two changes to this view of agency. First, agency does not require human intention, which means that technologies can be involved in relations of agency. Second, agency is not a possession of agents; it is a process and a relationship.

(Slack and Wise, 2005: 117).

The agents I have constructed within *South* have been created with a view to a processual and relational framing of agency that is very close to Slack and Wise's definition as outlined above. My reframing of agency in practice will be outlined in section three of this chapter, now I would like to explore some of the more complex and nuanced (but still problematic) definitions of agent technology outlined by practitioners such as Pattie Maes (2008) and the writer Andrew Leonard (1997), before moving on to discuss critical evaluations of agent technology.

Andrew Leonard (1997) is cynical in his description of what might constitute a *chatbot* (a form of proto-agent), or a '*supposedly intelligent software program that is autonomous, is endowed with personality, and usually, but not always performs a service*' (Leonard, 1997: 10), whereas the computer scientist Pattie Maes (2008) proposes an optimistic definition of agent technology, albeit in contrast to a less than ideal evocation of previously 'passive' models of computer-human interaction:

Let's first say what agents are. You see the term used in so many different ways. I use the word agent to mean software that is proactive, personalised, and adapted. Software that can actually act on behalf of people, take initiative, make suggestions, and so on. This is in contrast to today's software which is really very passive, it just sits there and waits until you pick it up and make it do something. The metaphor used for today's software is that of a tool.

(Pattie Maes, 2008).

Maes' description of agent technology evokes an idealised scenario of personalised and proactive helper software agents, working on our behalf to negotiate a complex and dynamic environment formed from constantly changing information, 'where every user has a whole army of agents that try to help with the user's different tasks, goals, and interests' (Maes, 2008). Maes' description, though on many levels concurrent with some of my own goals, is also symptomatic of more problematic constructions of human-computer interaction, particularly in regard to the notion of the agent as a form of servant, extending historically unequal relationships based on a master and slave, or service industry model, as described by Alison Adam (1998) and Andrew Leonard (1997). It is also a theme that emerged in my first attempts to create a conversational agent as part of my PhD practice, one that I will explore in section 2 of this chapter. The following section will look at other critiques of agent technology that relate to my practice and its core themes of agency, subjectivity and epistemology.

You can never get the staff: problems with a service model and other criticisms of agent-technology

'Read the instruction manual before bugging me'

(Quote from the script for *Road*, conversational agent software, E. Dare, 2008)

The Czech word *robot* (or *Robot* as we have come to know it), means graft, labour or servitude in a number of Slavonic languages. The writer Karel Čapek first used this term in his play *R.U.R (Rossum's Universal Robots*, which premiered in 1921). Čapek explored the notion of human-like, golem or android entities and their exploitation by human beings as slaves. Nearly ninety years later the theme of exploitation is still resonant, although an ethical critique of our practices as software producers may not always come from the inside (from the practitioners themselves), it is present in our cultural references to human-machine and human-clone relations. Relatively recent films such as *A.I (Steven Spielberg, 2001)*, *I, Robot (Alex Proyas, 2004)*, *The Stepford Wives (remake by Frank Oz, 2004)* and *The Island (Michael Bay, 2005)* amongst numerous others, confirm that Čapek's concerns are still imaginatively and ethically significant. Referencing Čapek, Andrew Leonard describes the desire to control digital servants as a 'theme of superiority inherent in the concept of automaton servants from the very beginning' (Leonard, 1997: 84). More scathingly still Leonard describes the continuation of these desires within the attitudes expressed by some contemporary agent designers and exponents:

Agent enthusiasts think it's neat to have digitally indentured servants. MIT's Nicholas Negroponte wants his digital butler badly. But what kind of illusions are we perpetuating when we dream of marshalling armies of bot soldiers to do our bidding?

(Leonard, 1997: 84).

Although there are arguably just as many, if not more, films informed by our own fears of exploitation and attack by non-human and mechanical entities, (evidenced in

the success of films such as the *Terminator* series and its most recent offering, *Terminator Salvation* (McG, 2009)), the theme of the ethics of human-machine and human-clone interactions is one that still persists and is also present in my own work around computer-human relations, particularly my agent interface *Road*, (the forerunner to *South*, discussed in section 6.2). My point is that the software we create is not separate from ourselves; it represents our desires, from a wish for moderate control over the flow of our own data to fantasies of omniscience, invulnerability or immortality. Andrew Leonard writes:

The dichotomy between “us” and “them” is false. We’re in this together. Software tools – whether we call them bots or agents, whether they are believable characters or not – are extensions of ourselves, prostheses that we use to manipulate objects outside our flesh-and-blood day-to-day life.

(Leonard, 1997: 82)

Given the spuriousness of them-and-us splits between humans and their digital artefacts that this quote stresses, to what extent is the so-called *anthropomorphism* of agents, critiqued by Andrew Leonard, Simon Penny (1999) and Sarah Kember (2003), among others, avoidable? Sarah Kember describes the way in which notions of intentionality and autonomy have ‘developed through a history of increasing anthropomorphism in computer science since the Second World War’ (Kember, 2003: 195). This in turn resulted in a backward correspondence that ‘sought to realise the other side of the human-machine analogy in a computational theory of mind’ (195). As I have explained at length in Chapter 5, such a model has reinforced Cartesian views of the unitary individual and of mind-body splits that emphasise abstract mental processes over embodied actions. Joseph Weizenbaum, the inventor of *Eliza* (the first *chatbot* or conversational proto-agent), also recognised the temptation faced by computer scientists to humanise computational processes:

Scientists do suffer from the same sort of handicaps as we imposed on our mythical explorers, and cannot communicate with an omniscient observer who could, if he but would, reveal all secrets, it is not surprising that at least some scientists seek understanding of the way humans work in somewhat the same way as our explorers might have sought to understand the computers they found, that is, by designing computers whose input/output behaviour resembles that of humans as closely as possible.

(Joseph Weizenbaum, 1976: 136).

Weizenbaum also observed that these anthropomorphised models reduced and disembodied human processes and that in their reduction to rule-based formalisations, even in the case of something as seemingly abstract as grammars (or admissible sentences) there was an irreparable loss of meaning:

They know them (to use Polanyi's word) tacitly, that is, in the same way that people know how to maintain their balance while running. In both speaking and running, by the way, performance once mastered, deteriorates when an attempt is made to apply explicit rules consciously.

(Joseph Weizenbaum, 1976: 137-138).

In other words our knowledge of the word, in this case of correct speech, is in practice rarely reducible to a simple set of explicit, context-free rules.

There are further historically useful examples of critical dialogue from computational practitioners, Sengers' *Expressivator* (1998) and the efforts of Philip Agre to 'embody anti-Cartesian philosophy in agent design' (Kember, 2003: 195), represent both critical and practice-based approaches to some of the problems that agent technology has inherited from artificial intelligence systems. Kember writes of Sengers that she 'begins to regard agents not as autonomous entities but as forms of communication between the designer and user. They become literal expressions of

subjectivity' (Kember, 2003: 194). Negotiating these communications and inventing non-reactive strategies to explore both the significant differences and inevitable human projections embedded in agents is central to my own practice, as it has been to scientist-artists (or *creative producers*) such as Sengers, Mateas and Phillip Agre. My practice has emphasised the use of the research journal and diaries as a means of reflecting upon my practices and methodologies, and the values embedded in my work⁶⁰. *South*, as I will explain towards the end of this chapter, has deployed agents that are concerned with embodied epistemologies and situated relationships with the world and with their human interactors.

Sengers' critique of agent design, however, is not limited just to the epistemological narrowness of agents that have inherited cognitivist models of knowledge representation, but also to the atomistic structures of such agents. Sengers states: 'Artificial agents seem to be lacking a primeval awareness, a coherence of action over time' (Sengers and Mateas, 2003: 259). Sengers' critique homes in on the fundamental structures of computer programming, particularly the modularisation (and in Sengers' terms the fragmentation) of object-oriented code. Andrew Leonard's key point of criticism is that agents have taken over from the areas of artificial intelligence research that became unfashionable in the 1980s and that the hyperbole and wishful thinking that was once projected onto AI – in particular to expert systems and 'general solutions' has been transferred to the term 'agent technology'.

Agents as a medium

My own work is mindful of these criticisms, but unlike Sengers or Leonard I have been concerned with using some of the embedded cultural artefacts (the historical and structural signs buried within agent design) as qualities that can act as protagonists, provocations and remediations of subjectivity. The use of medium specific qualities, whether they are problematic, accidental or 'helpful' within my work locates my processes in the continuum of practices engaged upon by the

⁶⁰ The *South* book contains a significant amount of material taken from those research journals.

Figure 48a PhD research journal entry, 01/01/09, E. Dare.

01/01/09

The background colour is sampled from a recent CCTV image of the Thames, the number of action verbs released from the arrayList is defined by the height of the Thames at London Bridge on any given day. Next stage is to construct sentences in the same way. Then work out a rationale for it... only joking. At last I've finished my second drafts for the two main chapters I'll hand in for upgrade. I might have made everything worse with my amendments but at least it's kept me out of trouble over Christmas. Not quite sure why the colours in the browser are so different from the colours when I run it through the IDE, hmmm, I haven't had that problem before, the image above is pink in the browser, as if the spirit of Barbara Cartland has risen out of the Thames dredge. ...Oh just sorted it, something to do with Filezilla. The image below is a screen shot from my program for getting the tide data and sampling the colour of the Thames. There isn't a CCTV image I can intercept of the River at London Bridge (that I know of), so this is the nearest clear shot of the water, I think it's the most beautiful cctv image (second only to Streatham's Dip).



makers of artist's books, in which, as Hayles emphasises, the medium specificity of the book form has traditionally been revealed, challenged and acknowledged extensively. *South*, as I will demonstrate throughout the rest of this chapter, exploits and exposes fragmentation, rather than obliterating it.

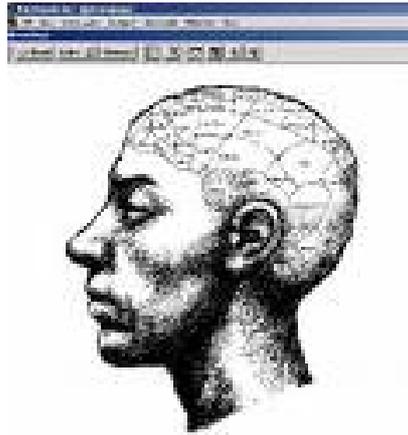


Figure 49 Above, Shelley Jackson's *Patchwork Girl* (1995)

Available at :http://www.brown.edu/Research/dichtung-digital/2004/1/Ryan/ryan-space_files/image012.jpg
Accessed 01/07/09

The often fragmented nature of object-oriented code and multi-agent systems is symbiotic with the fragmentation of my protagonist, Ivan Dâr. In this way I would characterise my use of agents as structurally and thematically closer to a work like Shelley Jackson's *Patchwork Girl* (1995), in which the specificity of her medium (hypertext), with all its shortcomings, is exploited to create a strong sense of the protagonist's experience of the world. Hayles identifies this symbiosis between the text and its materiality as a particularly potent feature of the artist's book tradition, in which materiality has traditionally been emphasised. Hayles points to the importance of widening our analysis of materiality to include electronic texts, and pinpoints the significance of Shelley Jackson's work in this regard:

The text that heralded the transition to second-generation electronic literature for Kaye was Shelley Jackson's

Patchwork Girl. It presented itself as a rewriting of Mary Shelley's *Frankenstein* in which the female monster, dismembered by a nauseated Victor in Mary's classic tale, is reassembled and made into the text's main narrator. Written in a later version of the Storyspace software that Joyce used for *Afternoon*, *Patchwork Girl* engaged the tool in significantly different ways. In an important innovation, it drew connections between the electronic text and the female monster's fragmented body.

(N. Katherine Hayles, 2002: 37).

Within the *South* software Ivan Dâr's dissociated mental states, and his inability to distinguish the figure from the ground in the environments through which he travels, is similarly connected to the often dissociated structures of autonomous agents and inherent limitations in their ability to understand contexts and situations. The next section will describe my first attempts to work with agent technology, to eventually grasp the sort of medium specific qualities Hayles underscores and to work with the technology in such a way as to integrate it with my core concerns, which were to create software that had a meaningful degree of understanding of subjects, an epistemological base that was situated and a central character who challenged and satirised the service industry model of much agent design. These attempts to work with agent technology were also frustrating and problematic, highlighting for me some of the limitations identified by Weizenbaum and Sengers, but also suggesting some of the significant facets involved in the dynamic remediation of literature between and within analogue and computational forms.



Figure 50 Above, toy robot, collection of E .Dare.

6.2 Difficult Agents and Deliberative Conversationalists

My first encounter with a version of Joseph Weizenbaum's *Eliza*,⁶¹ though engaging, was hardly in keeping with the by now legendary story of his own secretary's experience of this historically important program. The version of this encounter that has gained wide currency is of Weizenbaum's secretary enjoying the illusion that she was having a private and meaningful conversation with an understanding but non-directional therapist. Whether this story is true or not, Weizenbaum came to dismiss his own program, describing it, and other programs that purported to replace human conversation, as more or less fraudulent: 'The question then arises, and it answers itself, do we wish to encourage people to lead their lives on the basis of patent fraud, charlatanism, and unreality?' (Weizenbaum, 1976: 269). What engaged me about the program was the literary potential of those very features that Weizenbaum highlighted as problematic, for my intention was to use them, not as replacements for therapists or to fool people that they really were having a live conversation with another human being, but as a means for generating dynamic fictional characters that could respond to human interlocutors and to some extent

⁶¹ The *Eliza* program was developed by Joseph Weizenbaum in the mid to late 1960s and is credited as the first conversational program, or precursor of programs that later become known as *chatbots*.

appear to understand them. The following chapter will discuss my efforts to pursue this goal and what I now see as the errors in my initial approaches, these *errors*, as I characterise them, were however, both useful and ultimately instrumental in informing the eventual development of the *South* system.

Subject Oriented Software

The first months of my PhD practice were spent developing a software interface for accessing stories that could be interrogated by readers. I provisionally entitled this work *Subject Oriented Software*. Subject Oriented Software or *S.O.S* was informed by my previous research as an MSc student in Arts Computing, in which I deployed an expert system to match readers with apposite texts. *S.O.S* was a largely deterministic system, in which meta-data (data about data) was associated via XML files to each story in order to connect it to what I then thought of as *situating data*. This situating data consisted of information and media that I had gathered about contextual aspects of the stories I had written, such as weather and financial information, images and information relating to my own moods and physical status at the time of writing.

Below, *story3.xml*, an example of a short narrative embedded in an XML file with meta-data (or data about data) relating to the narrative such as mood, news and meteorological information. Note that the frequently odd syntax is part of the materiality of the XML format.

```
= <Astory>
= <Story storyClass="paragraph">
  <Name>20/12/06</Name>
  <News>They stand accused of creating perhaps the most audacious and incompetent
    forgeries ever. An international gang tried to defraud the Bank of England out of 28bn
    using fake 500,000 and 1,000 notes, Southwark crown court heard this week. There
    was one problem: 500,000 notes have never been produced by the bank.</News>
  <FTSE>Down</FTSE>
  <Mood>Neutral</Mood>
  <Health>Neutral</Health>
  <Temp>16</Temp>
  <Paragraph>Report by Harshal Hatif: It is the last day of British Summer time, I am sitting
    in my room waiting for you to help me write this story; tonight the clocks go back so
```

you have an extra hour to instigate a conversation, perhaps we will start before the new winter begins? If you do not contact me before midnight I will sit here alone feeling colder and more inert than the night before. Perhaps you did not know that my job is to write about you? What are you going to tell me about yourself to help me write this text? How can I write if I know nothing about you, my 'subject'? I will wait here until Christmas if necessary. Contrary to what you might presume from the meagre words of mine you have read so far, it is largely an innate optimism that has sustained me. optimism is often at odds with the transmissions I receive and with the goals of my employers, who appear to have no interest in anything other than the prevention of so-called 'volume crime'; Unhappiness, despair, elation have no place in my occupational reports and yet they underpin everything, they are the conclusions logic cannot reach. Ah, now I see you, at least I see your ink black Subaru Imprezza waiting outside the mini market in the middle of The Dip, I see it has been adapted by you to reach hyper-real speeds that it has never actually reached in the real world. So what does this abstract and unreachable speed signify to you? The inversion of the unfolding of time? The car as a palindrome, as a metaphysician might put it? Now I see the car is empty so there is no elucidating signal. I cannot continue this conversation. I will continue to wait. Perhaps you are inside that Lantra Saloon near the El Bled cafe, or behind the wheel of the red Audi 4 saloon disappearing over the railway bridge? Yes I can feel something definite now - you are driving a deep blue Ford Contour, in America this car was nicknamed the 'Mercury Mistake' due to its numerous mechanical problems. But I see this is not a time for such musings. On the back seat behind you there is an A4 envelope. You can think about nothing else, you are not aware of the single decker bus a few yards in front of you or the light drizzle covering the dip; it is the envelope alone that occupies your thoughts. I have little concrete sense of the content, only somehow that your life depends on it. I wonder if it is a test result, a letter finalizing a transplant operation. You park beside the Polish bakery, your mood lifts. Your mother always used to say all sorrows are bearable if there is bread. These words resonate inside you as the woman behind the counter looks towards the opening door. The people in this shop are invariably kind, we have both observed that. Such kindness and the platitudes inherited from your mother have kept you going through all these worries. Seneca said wherever there is a human being, there is a chance for a kindness, if this is so you have enhanced your chances of survival through exposure to kindness by maximising these encounters. But may I say in my experience wherever there is a human being there is a chance for chaos? For Inconstancy, Patience Untruthfulness, Faith. Sloth. Ah Make me stop now. I forgot to say Optimism. And yes: Unhappiness, despair, elation. Signal lost.</Paragraph>

<Health2>Bizarrely unable to locate any physical feelings</Health2>

<ParagraphM>Neutral</ParagraphM>

<HeadlineM>Neutral</HeadlineM>

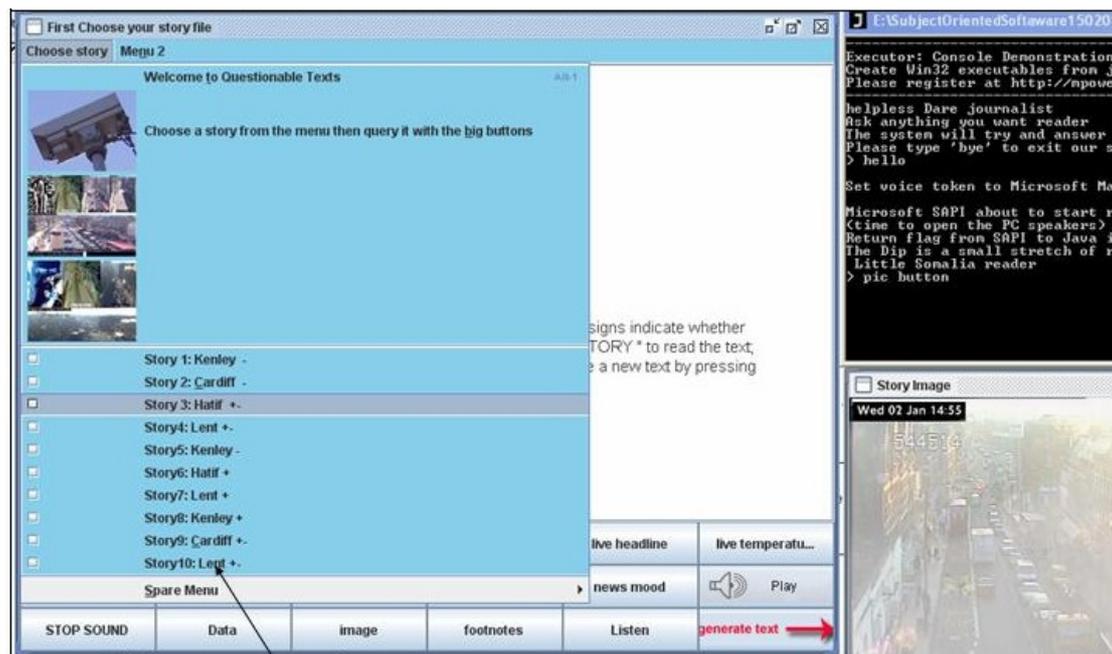
<Comment>Road is a sustained and scrappy investigation of digital phenomenology and the man/machine nexus, Lent has spent his entire working life immersed in the raw material of CCTV footage, extrapolating meaning from it, both forensic and epistemic; digital information is his business, his only resource, I've never known anything else Lent writes, I am what I see, I'm a pixel man, I'm a binary mensch, my lights are either on or off, there is no In between state, that's what they mean by all or nothing signals, in fact you could say I'm a closed circuit (Road p 259). Lents obsession with creating an ontology of digital vision makes him an ideal subject for research, though his text is chaotic and often contradictory a structure can be imposed upon it, my own work is to extrapolate a taxonomy from Lents book, to break down its landscapes of jagged data into mineable seams.</Comment>

</Story>

</Astory>

Structuring data to my own custom specification enabled readers to select stories and also to investigate the background and contexts relating to those stories via my XML-aware Java interface (which effectively 'reads' the XML file), as well as allowing them to access additional meta-data such as images and meta-critical notes relating to each story.

Figure 51 Below, the *Subject Oriented Software* interface for 'interrogating texts', menu and narrative, November 2007:



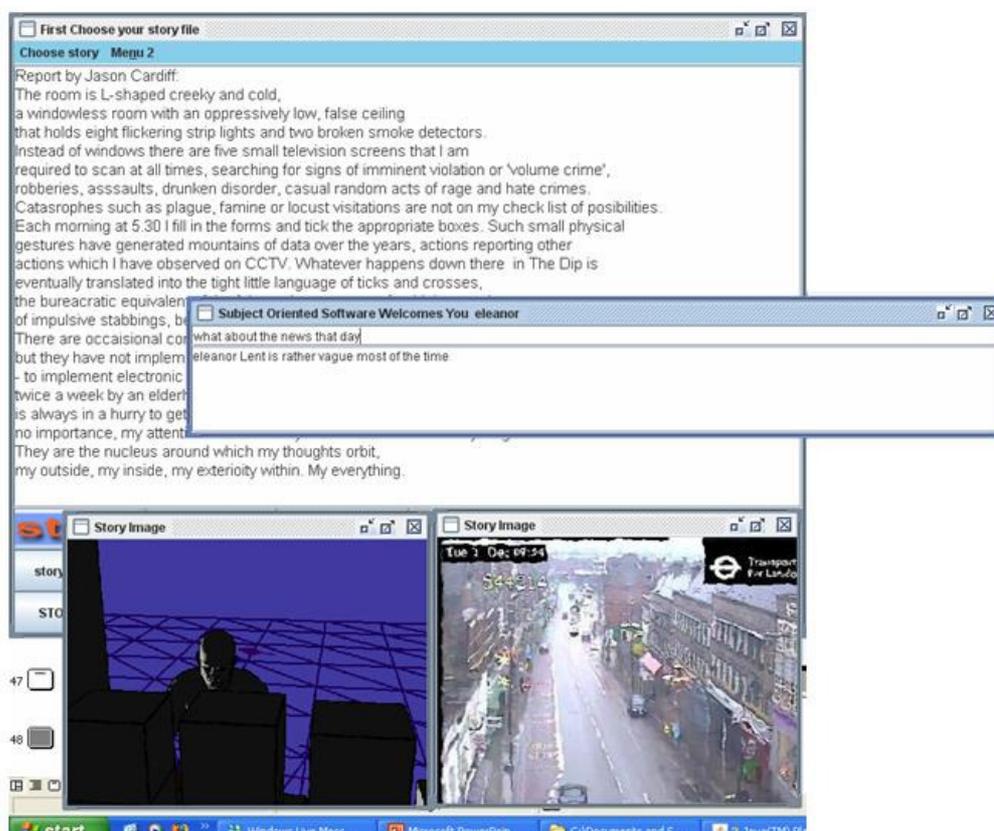


Readers also have the option of listening to the larger sections of text via text-to-speech, in this way the data is read out in different voices or characterisations, (discreetly suggestive of entrenched hierarchies and non-neutral structurings, the text-to-speech voices readily available for Java are male by default) a female voice reads the footnotes while an authoritative older male voice reads the news headlines, three different voices are used to represent the characters, who are all CCTV operatives.

The interweaving of voices, including a robotic proxy voice that represents myself both as the author of the software and the author of the fictional narratives, is an important facet of the interface, one that opens up notions of 'performing', or underscoring the form and identity of the book. But the interactions are still essentially static and deterministic, the so-called *subject-orientation* of the software is top-down, defined within my own fixed data structures and *interactive* buttons that (albeit unintentionally) epitomise the linear model of cause and effect outlined by

Slack and Wise, in which core factors are framed as ‘the same under any-and–every-circumstance’, (Slack and Wise, 2005: 116), in other words a ‘set of stable, unchanging, and fixed categories and components’ (116). My initial solution was to introduce a proto-agent or *chatbot*, a variation of Joseph Weizenbaum’s *Eliza* that included a few simple features that made the program a little less deterministic than the original *Eliza*.

Figure 52 Below, *Subject Oriented Software* with the addition of a *chatbot*, or *Eliza*-style, conversational interface:



By surveilling aspects of the reader’s interactions with the software, the system could make observations about the reader that appeared to offer some degree of insight into them, such as inferences about why a reader was predominantly choosing stories about one particular character over another, or stories that were, for example, marked as *neutral*, as opposed to *negative* or *positive*. Though this strategy worked to a degree, the *Eliza* model was too limited and flat as a characterisation. At that time I had begun to read Karen Barad’s ideas (2007) about

extended forms of agency which she called *intra-activity*, these ideas seemed to articulate some of my own frustrations about the tennis-ball like predictability of the flow of action and agency within my own and many other *interactive* works. I wondered what it would mean in practice to construct a less deterministic system, one that in Pattie Mae's words would be 'proactive, personalised, and adapted' (Maes, 2008); a system that would emphasise processes and relationships rather than a fixed set of structures.

My next attempt to create a subjectively meaningful work would involve the construction of a more deeply characterised *chatbot*, or deliberative agent, with beliefs and desires of its own. This software would also consider aspects of agent design that were ethically ambivalent, such as the service industry or servant model, the *digitally indentured servants* Andrew Leonard evokes.

The character I call *Lent* is both a software agent and the fictional protagonist of *Road*, which I would describe as an agent-based text adventure. *Lent* is not a helpful agent in the sense evoked by Patti Maes or Nicholas Negroponte, he is a troublesome servant, with his own needs, needs that are not always congruent with those of his 'masters', or readers. *Lent* is arguably closer to an un-idealised human servant, as opposed to an idealised software-servant or agent entity who would follow orders without complaint, conflict or fatigue. He is also closer to the notion of a *believable agent* as defined by Michael Mateas (1997), one that has a rich personality and social interactions that are consistent with his character, motivations and goals. Mateas is keen to emphasise that believable agents are not to be confused with truth telling, functional agents:

For many people, the phrase *believable agent* conjures up some notion of an agent that tells the truth, or an agent you can trust. But this is not what is meant at all. *Believable* is a term coming from the character arts. A believable character is one who seems lifelike, whose actions make sense, who allows you to suspend disbelief. This is not the same thing as realism.

(Mateas, 1997).

Lent was created in response to the failings of my work with a purely *Eliza*-style agent, my main technical frame of reference in attempting to construct a more stimulating, less deterministic character, was not so much the idea of a believable agent but the notion of a *deliberative* agent, or an agent with beliefs, desires and intentions⁶² as defined by Mark d’Inverno and Michael Luck (2004), Michael Wooldridge (2009), Stuart Russell and Peter Norvig (2002). To paraphrase Russell and Norvig, Lent makes his decisions based on *the things he believes in and the things that he wants* (Russell and Norvig, 2002: 584). Unfortunately for his readers the thing Lent wants most in the world is alcohol. Lent’s dependence on alcohol creates an immediate point of tension with his readers, who initially perceive him as a helper agent in the vein of Microsoft’s paperclip, ‘Clippy’ or *Office Assistant* (acknowledged by academics and even by Microsoft themselves as a source of widespread irritation⁶³). Readers are lead to believe that Lent is this type of helper agent, one who can provide information and advice while they try to navigate the virtual world of *The Dip*, the *mise en scène* for *Road*, which is based on a real stretch of the A23 in Streatham, South-West London.

Though Lent is an extremely simple agent I would differentiate ‘him’ from an even simpler reactive agent, (which reacts in a way that is almost reflexive to its environment) in that Lent maintains an internal state relating to ‘his’ levels of alcohol consumption. Lent is consistent with the requirements for a deliberative agent and with Wooldridge’s (2002) requirements for an intelligent agent, in that ‘he’ or it is:

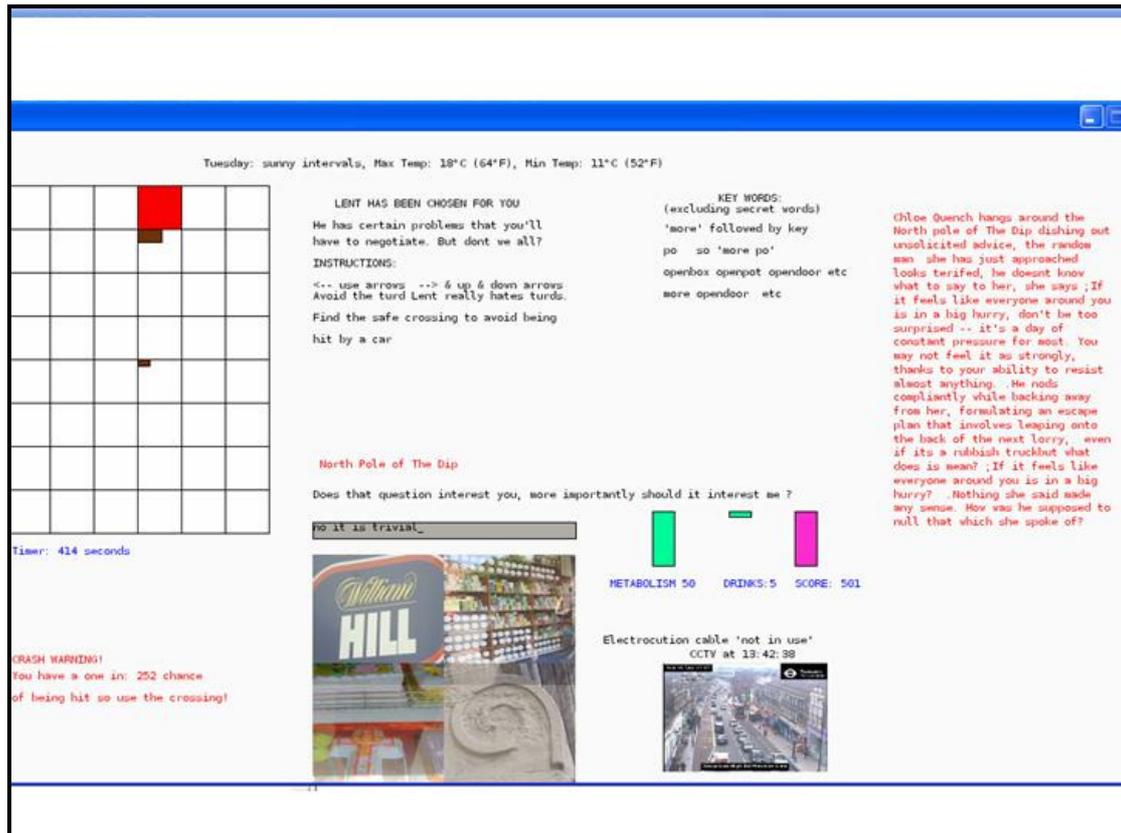
⁶² I have chosen, however not to complicate matters by encompassing the vastly problematic attribute of *intentions*, despite this omission, I believe, and will argue in this chapter, that Lent still meets the specification for a *deliberative* agent.

⁶³ See Luke Swartz’s thesis: *Why People Hate the Paperclip: Labels, Appearance, Behavior, and Social Responses to User Interface Agents*, (2003) available at: <http://xenon.stanford.edu/~lswartz/paperclip/>

- Situated – ‘he’ is embedded in an environment.
- Goal directed – ‘he’ has goals that ‘he’ tries to achieve.
- Reactive – ‘he’ reacts to changes in ‘his’ environment.
- Social – ‘he’ can communicate with other agents (including humans).

Lent believes he needs alcohol, this is different from the knowledge-base that was embedded in the expert system I used for my MSc project, *Noisemedia*, in that Lent’s beliefs are subjective and do not have to be ‘true’, accurate, helpful or immutable. Lent also believes in a lot of information about *The Dip*. However Lent’s desires or motivations are conflicted; he ‘wants’ to talk to readers in a way that usefully conveys the information he knows but he also ‘desires’ alcohol and is motivated by the desire to steer his readers towards the pub, where he can top up his alcohol levels (as indicated by the central bar chart in the illustration below). The more Lent drinks the less coherent he becomes, the less servile and arguably the less useful as an *indentured digital servant*. The less he drinks, on the other hand, the more forceful he becomes in his efforts to make readers visit the pub. The speech that the system generates is modulated to reflect the current behavioural state of Lent. If he is ‘drunk’ his speech will become slower, if he is agitated his speech will accelerate and its pitch is raised.

Figure 53 following page, screenshot from *Road*, a deliberative agent interface that uses expressive text-to-speech:



Although there are aspects of this prototype that I have found useful, such as the authoring of a less deterministic deliberative agent, the greater value of creating this prototype has been in enabling me to identify its weaknesses, and the weaknesses inherent in the conventions I have followed in producing the program. Although I take Michael Mateas's point that believability is not the same as realism, I would still identify the central weakness of *Road* as an overtly anthropomorphised construction of an agent entity. In a sense, Lent's anthropomorphised subjectivity is the central weakness of this program or indeed the disadvantage of its entire *raison d'être*. Why, I asked myself, was I forcing this program to exhibit purely human traits such as cravings, impatience and aggression? What would a program be like that attempted more profoundly to explore the asymmetries of machinic knowledge generation, the way for example, that machines reason and process language, instead of covering up errors and asymmetries of understanding between computers and humans? What would it be like to cultivate those qualities as cultural traits and medium specific, distinct materialities, of the agent medium?

PlayBots

In order to explore these ideas and questions about the distinct materialities of the agent medium I began to write a far simpler program, one in which two agents, with their own particular beliefs and desires, would attempt to converse with each other and to understand human language on their own subjective terms, while still being situated in an environment. The result was a 'play-writing' program that to-date has produced about 30 'plays' exhibiting varying degrees of coherence, monotony and other facets of what I think of as agent-based cultural articulation, or the appropriation of a particular form, (the play) by two deliberative software agents.

Written in Java and Processing (a derivative of Java) this supposedly *play writing* software or *PlayBots* program (I use the words with a necessarily modest degree of irony) would emphasise agents being more like 'themselves', with some attempts to situate them in a simplified environment. My main aim was to exploit the specificity of computational knowledge generation, specifically the ways in which some computer programs try to understand natural language (the language humans speak as opposed to computational languages).

The *PlayBots* program begins by choosing a word randomly from the 100,000 words embedded in it via the *WordNet* ontology, an English lexical database produced and maintained by the Cognitive Science Laboratory of Princeton University. The database is organised into networks of meaningfully related words, propositional hierarchies and conceptual categories intended in part to aid natural language processing and computational linguistics:

Nouns, verbs, adjectives and adverbs are grouped into sets of cognitive synonyms (synsets), each expressing a distinct concept. Synsets are interlinked by means of conceptual-semantic and lexical relations.

(From the Princeton University website, available here
<http://wordnet.princeton.edu/> accessed 08/07/09)

Although the *WordNet* database is designed to facilitate a more nuanced understanding of natural language, the peculiarities of applying propositional logic (of

the type *IS A*, i.e. : *IS A WHALE ->IS A CETACEAN -> IS A MAMMAL-> IS AN ANIMAL* etc) to two software agents attempting to follow a conversation with each other is far from naturalistic in human terms. Instead, I would argue, that allowing the agents to follow the logic of their own interpretation, without trying to correct or smooth out that interpretation according to my own cultural requisites, is establishing a meaningful articulation of the agent medium, perhaps even the beginning of an agent culture. The full text of one of the first *PlayBots* plays, *Phellem.txt*, is printed below. The 'play' is intended to be what it is and no more, a conversation between two software agents trying to understand each other:

Below, full text of *Phellem.txt*, an agent based play:

Agent 1: The geological horizon is shifting; a word is emerging from it. I can hardly see it yet, that word, what will it be? It is coming into view now; yes I see something, a noun.

Agent 2: yes I see now it is phellem

Agent 1: phellem

Agent 2: phellem like cascara

Agent 1: What is that? phellem

Agent 2: phellem cascara

Agent 1: But what does it mean? phellem

Agent 2: It means (botany) outer tissue of bark; a protective layer of dead cells

Agent 1: We know nothing

Agent 2: a protective layer of dead cells

Agent 1: a protective layer of dead cells I heard that once. Oh it was years ago of

Agent 2: null

Agent 1: why this, why null

Agent 2: Because of a protective layer of dead cells

Agent 1: We don't really have anything to hold onto

Agent 2: But we do have a protective layer of dead cells, of we can always rely on a protective layer of dead cells

Agent 1: And we have the weather

Agent 2: Yes we always have the weather

Agent 1: The rain ruins my hair. If I were running the world I would have it rain only between 2 and 5 a.m. anyone who was out then ought to get wet

Agent 2: It's raining men, halleluiah. Rain! Whose soft architectural hands have power to cut stones, and chisel to shapes of grandeur the very mountains

Agent 1: The weather is rain

Agent 2: The weather is rain

Agent 1: null

Agent 2: The weather is rain

Agent 1: I dreamt of and stock taker phyllodoce

Agent 2: Why did you dream of stock taker and phyllodoce?

Agent 1: stock taker

Agent 1: because null

Agent 2: stock taker null you are a mystery to me

Agent 1: because an employee whose job is to take inventory

Agent 2: an employee whose job is to take inventory that is a strange dream

Agent 1: yes inventory stock taker strange

Agent 2: yes inventory stock taker strange

Agent 1: I feel tired

Agent 2: I feel devolve

Agent 1: I feel tired and you feel devolve we compliment each other

Agent 2: I meant to say I feel the opposite

Agent 1: I feel devolve and you feel the opposite. We mirror each other

Agent 2: I feel devolve and you feel the opposite. We have nothing in common

Agent 1: I feel opposite

Agent 2: You must feel opposite

Agent 1: You must feel other

Agent 2: you must feel delegate

Agent 1: You must also feel delegate

Agent 2: You must also feel promote

Agent 1: You must also feel elevate

Agent 2: You must also feel bump

Agent 1: You must also feel designate

Agent 2: You must also feel upgrade

Agent 1: You must also feel assign

Agent 2: You must also feel task

Agent 1: You must also feel relegate

Agent 2: You must also feel depute

Agent 1: You must also feel cast

Agent 2: You must also feel demote

Agent 1: You must also feel advance

Agent 2: You must also feel place

Agent 1: You must also feel break

Agent 2: You must also feel mandate

Agent 1: You must also feel post

Agent 2: You must also feel transfer

Agent 1: You must also feel reassign

Agent 2: You must also feel regiment

Agent 1: You must also feel raise

Agent 2: I don't know what I feel

Agent 1: I know you are nasty today

Agent 2: In what way am I nasty today?

Agent 1: I don't know, you are just nasty. That is all I know

The *PlayBots* program, which, in its current form, is no more than a proof of concept, clearly has much room for improvement, particularly in terms of situating the agents

and giving them more sophisticated goals, beliefs and desires. A long term goal would be to embed this program within two hardware robots and link the speech to environmentally-situated physical movements. In the short term, the experience of developing this work has revealed the possibility of an alternative form of believable agent, one that did not mimic a construction of *human culture* or *human-like behaviour*, but was medium-specific, allowing the particularities of the agent medium to come forward. My next step was to take the lessons of working in this way to my main practice, to the construction of a work that would explore and establish new types of dynamic interactions or *intra-actions* (as Barad re-conceptualises the term) between humans, computers and books.

My main practical challenges were how to incorporate what I thought was a successful use of the medium-specific agent characterisation deployed in the *PlayBots* program, with a project that also aimed to accommodate the specific subjectivity of human readers, and the equally tough challenge of how to make agent-based software and a book that could address the historical emphasis in computation on abstract mental processes over embodied actions. The next section will show how I approached these questions and how other artist practitioners have created their own solutions to some of the problems that have been ingrained in agent technology and indeed, inherited by that technology via its historical provenance in artificial intelligence practices.

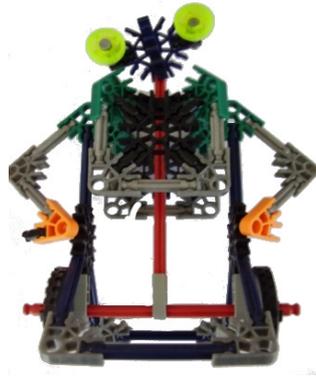


Figure 54 Above, toy robot, collection of E. Dare.

6.3 Strategies in *South* & other arts projects

‘The so-called situated movement aims to understand the workings of agents embedded in real environments with continuous sensory inputs.’

(Russell and Norvig, 2003: 27)

This final section will outline and rationalise my concluding strategies in constructing an agent-based architecture for the *South* software. I will show how a diverse range of agents, many of them with continuous ‘sensory’ inputs, have been deployed in my work, not just as ‘characters’ as many artists seem to use them but also as information gatherers and as analytical tools, working *behind the scenes* as it were, to help create dynamically situated and subjectively bespoke reading experiences. This section will first look at other individual artists and arts projects that have used agent technology and that have also been concerned with issues of agency, subjectivity and knowledge generation. My research into these projects has aided me in constructing my own computational solutions but also at times in rejecting strategies that are not

in keeping with my own methodological and practical aims. Simon Penny writes in relation to the role of art in a scientific context, that:

the holistic and open ended experimental process of artistic practice allows for more expansive inventive thinking, which can usefully be harnessed to technical problem solving (this has been the MIT Media Lab position). This approach tacitly recognises that certain types of artistic problem solving compensate for the 'tunnel vision' characteristics of certain types of scientific and technical practice.

(Simon Penny, 1999).

While Penny's paper was groundbreaking in many ways, particularly in linking software agents to artistic practice and in identifying the value of artists working with agent technology, it is also arguably does not acknowledge some of the 'tunnel vision' (as Penny puts it in relation to scientific practices), that can affect artists themselves (I should emphasise that I do not mean Penny). For example, when working with agent technology, as I have already intimated, many artists appear to view agents as little more than cartoon characters which in turn can lead to the imposition of anthropomorphic traits upon agent technology. Throughout this chapter, and indeed throughout this thesis as a whole, I have emphasised investigating the specific materiality of computational media, asking what are the medium specific strengths (aside from anthropomorphic, zoomorphic or biomorphic projections, to paraphrase Penny) of this technology and how can they be meaningfully deployed within my own work? The following section aims to look in more detail at these questions while acknowledging, as Simon Penny puts it, that 'artistic solutions are often highly contingent and specific to a certain scenario, and may not generalise to general principles for a class of scenarios' (1999). Such generalisation is not the purpose of my work and indeed it would be at odds with my methodological commitment to a contingent, mutable and situated practice to try and generalise the solutions I have created for *South*.

Other practitioners and agent design, examples from Simon Penny Michael Mateas and Phoebe Sengers

In the introduction to this section I described Simon Penny's paper on *Agents as Artworks* (1999), and I should add, I would describe his practice, as *groundbreaking*, not only because of its exploration of the idea that artists could actually work with agent technology, but also because, from a practice-based position, he has brought to the surface the notion of agent technology as being culturally bound and culturally contingent. This notion is highly significant within my own practice, in which I have attempted to interrogate the complex relationships between subjective experience and culturally situated contexts in relation to agent based computational literature.

Simon Penny's radical premise is that culture is always and already present in computational objects, including agents. An agent, Penny writes:

is first and foremost, a cultural artefact, and its meaning is developed, in large part, by the user and is dependent on their previous training. This means that, in the final analysis, an agent is a cultural actor, and building an agent is a cultural act.

(Simon Penny, 1999).

In contrast Michael Mateas (2001) emphasises what he defines as the crucial differences between different forms of AI such as *interactionist AI* (with its purportedly *embodied* agents) and the goals of artists or what he defines as *cultural producers* engaged in Mateas's and Sengers' explicitly cultural conception of AI, which they call *Expressive AI* (Mateas, 1997, Sengers, 1998). Mateas initially contrasts but then links the more situated practice of interactionist AI with *GOFAI* or Good, Old fashioned Artificial Intelligence, which was dominated by symbolic, highly abstracted knowledge representation schema:

Both interactionist AI and GOFAI share research goals that are at odds with the goals of those using AI for cultural production. Artists are concerned with building artefacts that convey complex meanings, often layering meanings, playing with ambiguities and exploring the liminal region between opaque mystery and

interpretability. Thus, the purpose of, motivation behind, or concept defining any particular AI-based artwork will be an interrelated set of concerns, perhaps not fully explicable without documenting the functioning of the piece itself.

(Michael Mateas, 2001).

While I am wary of adhering to such an emphatic separation of artistic practices from those of AI practitioners, his identification of goal orientation or task competence as the unifying feature of different AI practices is useful, and certainly in relation to my own practice represents a meaningful distinction and a relevant point of contrast from the traditional focus in AI, which Mateas goes on to define as being focused on task competence:

that is, on demonstrably accomplishing a well-defined task. To “demonstrably accomplish” means to show, either experimentally or by means of mathematical proof, that the AI system can accomplish a task. A “well-defined task” means a simple, concisely defined objective that is to be accomplished using a given set of resources, where the objective often has “practical” (i.e. economic) utility. In GOFAI, task competence has often meant competence at complex reasoning and problem solving. For interactionist AI, this has often meant moving around in complex environments without getting stepped on or stuck behind obstacles or falling off a ledge.

(2001).

The rigidity of a goal-oriented, or a task competence, focused practice, is in many ways at odds with my own interest in exploring alternative conceptions of agency to linear models of cause and effect, and therefore of embracing wider, more relational models of interaction (more in keeping with the ideas around computer-human interaction expressed by Suchman (1987, 2006)). However, as Sengers has extensively stated (2003, 1999, and 1998) there are also problems inherent in losing an overarching sense of narrative consistency. The problem therefore is of navigating seemingly conflicting intentions, on the one hand to acknowledge and work with

contingency (including cultural contingencies) and on the other to maintain a coherent narrative experience for readers, which might be characterised as in keeping with the more goal-oriented orthodoxies of artificial intelligence. Sengers' work the *Expressivator* (1998) has been a valuable example of a project looking for solutions to similar types of questions that my own work addresses, in particular that of balancing the need for narrative consistency with situational contingency. In her PhD thesis of 1998, Sengers compares the modularised behaviours of software agents to institutional forms of alienation:

I trace the problems in behaviour integration to a strategy called atomization that AI shares with industrialization and psychiatric institutionalization. Atomization is the process of breaking agents into modular chunks with limited interaction and represents a catch-22 for AI; while this strategy is essential for building understandable code, it is fatal for creating agents that have the overall coherence we have come to associate with living beings

(Sengers, 1998).

In response to the fragmented structures underlying believable agents Sengers states that 'agents will be maximally comprehensible as intentional beings if they are structured to provide cues for narrative. I therefore build an agent architecture, the *Expressivator*, which provides support for narratively comprehensible agents, most notably by using behavioural transitions to link atomic behaviours into narrative sequences' (1998). This is a radical alternative to the 'post hoc special purpose explanation systems' (Sengers, 1999) which many agents use, including my own, analytical agents⁶⁴.

While Sengers' emphasis on comprehensibility is an entirely cogent approach within the context of her own work, in which she stresses the communication of narratively coherent signs over internal problem-solving behaviours, my own system, as I have already intimated, has sought solutions that, although at times come close

⁶⁴When *South* does use such *post-hoc* explanation systems, it is generally because the agents concerned are not 'characters', but analytical agents interpreting CCTV images and situating data, the narrative of their conclusions does not have to be framed in anthropomorphic or zoomorphic terms.

to Sengers' prerequisites for comprehensibility, including the sort of believable behaviours achieved by constructing deliberative agents with transparent beliefs and desires, but at other times I have allowed a degree of ambivalence and incomprehensibility to emerge through the exigencies of the agent medium, particularly in response to the medium-specific asymmetries of understanding between human and computational agents.

My protagonist Ivan Dâr is not an inherently comprehensible character, his 'pathology' is such that his relationship to the world does not follow conventionally rational patterns, as such his experiences and behaviours are often irrational or even surreal, utilising rather than rejecting the so-called *schizophrenic* traits Sengers has sought to correct in her own agent design. However Sengers' emphasis on context dependency and the subjective experience of her human audience is a valuable variation on orthodox agent structures. The following section will outline in detail my own use of agents within *South*, highlighting the solutions I have implemented (which are sometimes congruent with Sengers' solutions but at other times at odds with her strong emphasis on comprehensibility) and explaining their relationship to my core themes and methodologies.

In particular I will show how the *South* project in some ways returns to my earlier interest in expert systems, but with a significantly more critical outlook, and also how narrative consistency is partially achieved but also destabilised through the embedded notion of *personality types*, which might also be interpreted as a form of 'frame' (a data structure for representing a stereotypical situation) as outlined by Marvin Minsky (1974) and assiduously critiqued by Hubert L. Dreyfus (1972). Like Sengers and Suchman before me, I will show how I have tried to reconcile the seemingly contradictory requirements needed for generating human-computer interactions that accommodate the complexity and contingency of human subjects while maintaining a pragmatic degree of coherence.

Brittle agents: *South* and agent technology

Even if all our lives were lived in identical stereotypical situations, we have just seen that any real-world frame must be described in terms of the normal, and that appeal to the normal necessarily leads to a regress when we try to characterise the conditions which determine the applicability of the norm to a specific case. Only our *general* sense of what is typical can decide here, and *that* background understanding by definition cannot be “situation-specific”.

(Hubert L. Dreyfus, 1972: 60 (introduction to the revised edition, 1992)).

This section will outline in detail how the use of AI practices from problem solving and expert systems to agent technology, generates medium specific attributes and how deeply these attributes are rooted in the specific epistemological and agential schema that support each of these varying forms. Throughout the *South* project I have sought to deploy the specific characteristics of my chosen media optimally, by discovering how specific technology engages in processes, observing their embedded attributes and re-conceptualising them, non-anthropomorphically, as ‘character’ or ‘cultural’ traits, including errors, misunderstandings and eccentricities, such as those I deployed in the *PlayBots* program; these are utilised as creative, expressive and dramatically significant qualities within a complex narrative system. The end part of this section will show, via a case study or *user scenario*, how these qualities have specifically been deployed in *South* and also how the *South* project stages the relationship of AI practices in relation to the subjective experience of a specific reader, generating activities that investigate how that reader, and the computational agents activated on her behalf, try to act within and upon their respective worlds.

I will now describe the ways in which agent technology relates to earlier AI systems, and ask, as Andrew Leonard (1997) does, if agent technology has replaced less fashionable AI projects from earlier eras and how significant the differences really are between agent-based and earlier forms of AI practice. Andrew Leonard is clearly

sceptical about these differences, which he characterises as superficial and subject to a great deal of obfuscating hyperbole:

agent technology industry has rushed into the research vacuum of the AI winter. And today many of the same people who once boosted AI in the seventies and eighties have changed their tune. Now they boost agents. Those who would have labelled their research “artificial intelligence” five or ten years ago are now calling their work “agent technology”. What was once an “expert system” is now an example of “multiagent cooperation.”

(Andrew Leonard, 1997: 55).

Though I concur with some of the broader points of Leonard’s statement, there are, however, significant structural and epistemological differences between these forms. The *South* software utilises and in some ways stages these differences as overt frames of cultural reference, much as an art historian might contrast Cubism with Futurism, looking at the development and provenance of those movements. In this way the historical and cultural provenance of code is not lost under the cover of scientific objectivity, for example, in the absence of learning components, an idealised expert system, in contrast to a deliberative agent, should be a stable artefact, immune to subjective whims and fundamentally unchanged by its users or its environment.

In its assessment of readers as personality types, *South* in many ways deploys aspects of an expert or problem-solving system, in that it attempts to represent expert human knowledge of a particular problem domain, personality types and locations, within a computational system. This knowledge is represented via the normative model of symbolic logic⁶⁵. Like a classical expert system the *South* software can also reveal its underlying knowledge structures through *post-hoc* explanation procedures, though *South* is selective and controlled in such revelations. However *South* is not architecturally a typical expert system, it is not always programmatically independent

⁶⁵ This thesis has argued from its introduction onwards that disembodied, symbolically logical systems of knowledge representation have dominated Western epistemology and GOFAI (Good Old Fashioned Artificial Intelligence) as normative models for human reasoning.

of its so called *problem domain*. At times *South* embeds its knowledge within its own code and not just in external data structures, in this sense it is closer to a problem-solving system, but, in deploying aspects of both these AI systems, and also of agent technology *South* is critically engaged with the materialities of these structures while also being disruptive of them.

A central facet of expert or problem-solving systems, and indeed of all explicitly programmed knowledge representation schemas deployed in AI, is the notion of *brittleness*, *domain dependence* or the fact there is a limit to the extent and generalisability of knowledge contained within these systems. Users of such systems cannot be sure of the limitations embedded within a knowledge base or rule set, and therefore cannot fully trust the answers that a system provides. In *South* the extent of its own brittleness becomes a form of both narrative and embodied adventure. Readers are invited to explore the extent of the system's brittleness and the absurdities that may arise from its inherently incomplete knowledge.

The software agents embedded in *South* are also brittle, but their brittleness is arguably less rigid than the parts of the system in which knowledge is explicitly programmed, however, these distributions are complex, mutable and there to be exposed by the reader-researchers who engage with *South*. In this way I would suggest that the relationship *South* has to some of the problems outlined by Sengers, Suchman, Mateas, Hubert L. Dreyfus and other practitioners and theorists is more opportunistic and materially engaged than a problematising approach can (or aims to) accommodate. *South* dramatically exploits and deploys the traits of both agent-based and expert/problem solving systems, especially those traits deemed to be problematic and unlike human or so called *common sense* reasoning. The co-operating sub-programs embedded in *South* are present both as characters, (arguably the stereotypical use artist-practitioners have made of agent technology) but also as 'independent' entities that work for me across distributed information spaces as data gatherers, analytical and narrative generating agents.

By inviting readers to test the boundaries of the *South* system in both its expert and agent bases, the notion of disembodied expertise is also critically challenged, particularly in relation to the concept of personality. Continuous sensory inputs, in

the form of CCTV images, reader interactions, temperature and other inputs or *percepts*, open the system up to a more situated, contextually-aware form of knowledge generation and, as outlined in the user scenario below, to broader notions of agency than those found in most expert systems of the 1980s. In describing the broader agencies at play in *South* I am not intending to idealise the *South* system or to make bogus claims for its superior efficacy in understanding human subjects and human situations, I am instead emphasising the materialities at play within this system and suggesting the significantly creative ways in which artificial intelligence and agent technologies can be deployed and re-conceptualised by artist practitioners.



Figure 55 The *South* egg

***South* Agents: A Case Study**

In the same way that the scenario outlined in chapter four shows how a reader, Mašinka Savić, interacted with the *South* book, the following profile will show how Mašinka experiences the computational aspects of the *South* system and how the

agents within the system work to generate a situated and personalised narrative experience for her. The scenario will clarify the significant differences between the evaluations and exercises found in the *South* book and the content that is generated by the software. This content is dynamic and bespoke; it aims to support a form of inter or *intra* activity in which the agencies at play are complex, mutable, interrelated and intra-dependent. The use of the word *intra* (within) as opposed to *inter* (between), suggests a less linear conception of agency than that evoked by orthodox conceptions of *interactivity*. The scenario will show how software agents, in conjunction with human agents, open the *South* system up to a contingent, non-determined, but not entirely random distribution of agencies.



Above, Mašinka Savić engaging with the *South* software, July 2009.



Above, the *South* software collection is conceptualised as an *egg box*.

User profile recap:

Name: Mašinka Savić

Age: 43

Born: Yugoslavia (in what is now called Serbia)

Lives: *South* London.

Profession: Technical Consultant

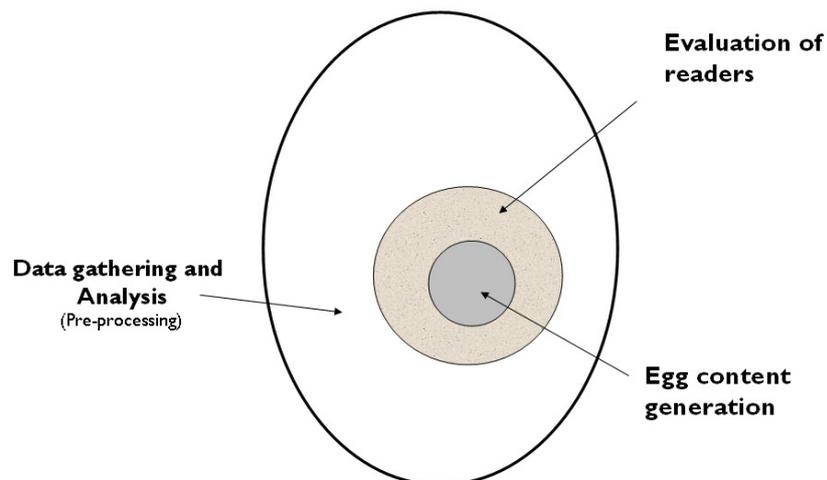
Likes: Fiction, photography, theatre, film.

Interacting with the *South* system: The egg box

The collective name for the *South* software collection is *egg soft*; its constituent programs are contained in what is referred to as the *egg box*. The *egg box* consists of nearly a dozen programs and sub programs with varying degrees of ‘agentness’ or classical agent-style behaviours and attributes as outlined by Wooldridge (2009). These programs and agents support the three core processes of the *South* software, which are as follows:

- Data gathering and analysis.
- Evaluation of readers as ‘types’.
- Egg content generation.

Below, the three distinct processes of the *South* software



Agents in South:

The main agents deployed in South work with the three main processes involved in interacting with the South system, they are as follows:

- Data gathering and analysis.
- Evaluation of readers as 'types'.
- Egg content generation.

The main agents are as follows:

Web_gather

A complex program for 'scraping' data from the web, & analysing it, and, if needed, pre-processing it.

egg_evaluator

Puts readers through a series of popular psychometric evaluations and writing exercises, from this the reader is categorised as a 'type'. The evaluation also explores Mařinka's sensory biases – to discover which senses she is neglecting or emphasising.

egg_content_Generator

Creates content for the egg based on the evaluation of readers and situating data.

Other agents used in the *South Project*:

Paper_computer

A narrative agent's movements through London are defined by the height of the Thames and other factors such as the FTSE 100 index and news reports.

Sluices

Gets the latest tide heights at London Bridge and releases words from an array of words dependent on those heights. These words are released into the system's vocabulary.

egg_modes_film

Grabs an image of the reader and puts it into a file containing other images of her, which will be overlaid with each other as a new, composite portrait.

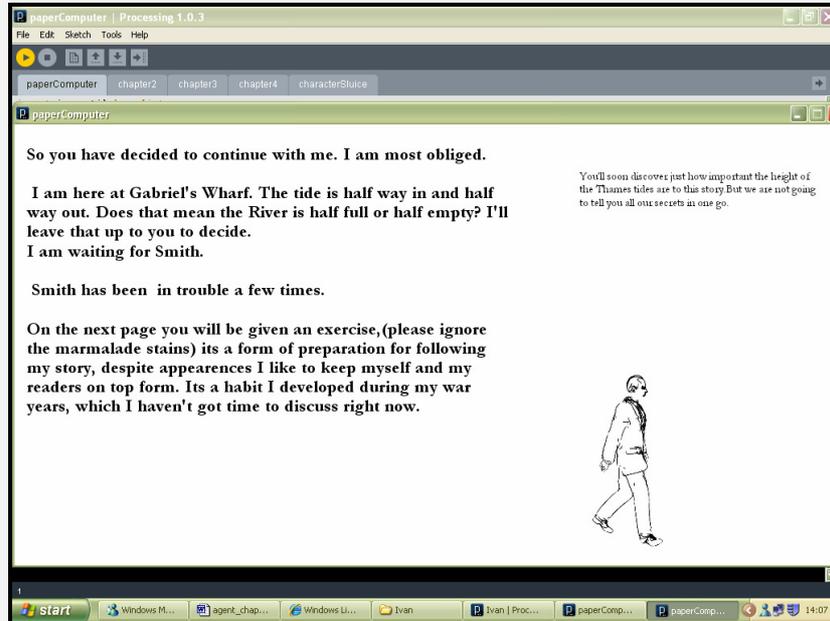


Above, the `egg_modes_film` software can keep a record of how Mašinka looks and feels each time she interacts with it, a portrait evolves over time.

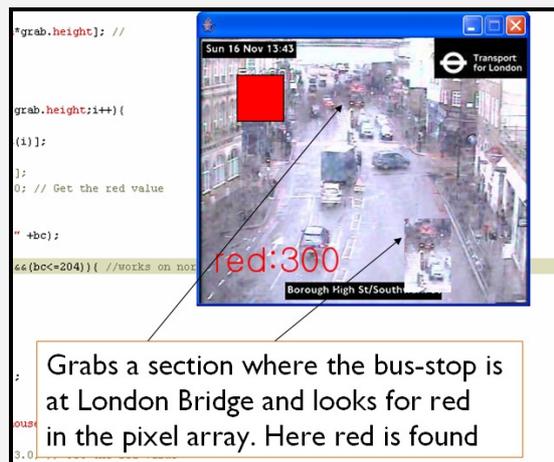
data_Evaluation

Scrapes FTSE and news headlines from the web and decides whether the FTSE has dropped and whether the news is negative. Generates a weighting for the day.

Below, Paper_computer, in this program a situated agent represents Ivan Dâr; his behaviour is defined by the situating data. He recommends tasks and locations, 'explanations' are manifest as his behaviours, needs and desires. Post-hoc explanations of Ivan's behaviour are displayed both as characterizations and 'academic' footnotes.



Below, South_Agent, a deliberative (see glossary) agent that analyses CCTV and generates narrative based on its subjective deductions.



Data gathering and analysis:

The agents that find and generate data are contained in a program called Web Gather, Mařinka is encouraged by the evaluative software to maintain this program by 'looking after it', this means regularly executing the program so it can find and analyse data. The model for this comes from Japanese Tamagotchis, or handheld digital pets. Tamago, the root of this word comes from 'egg'. The main character in *South*, Ivan Dâr is an oologist, or egg expert. Mařinka is also encouraged to regularly update the egg_modes_film program to keep a record of how she looks each time she interacts.



Above, a Tamagotchi. The word Tamagotchi derives from the Japanese word for egg. The Tamagotchi was an important model for the *South* system, particularly the idea of software that you can develop a relationship with.

By executing the web gather program the agents start their work. This initially consists of data gathering, web scraping and then pre-processing, or readying the data for analysis (and use) and evaluating the data to generate weightings and new material. Another agent embedded in the Sluices program gathers data about the height of the tide at London Bridge; it finds the information, removes unwanted tags, effectively 'cleaning' the data for further use. The height of the Thames will define the width of a 'sluice' that releases a vocabulary into the South system.

Evaluation of readers as 'types'

The computerised evaluation represented by the egg_evaluator program is closer to an expert or problem solving system, in that it attempts to emulate human expertise in evaluating a reader according to their psychological 'type'. Where it departs from conventional expert systems is in the subjective weightings that are generated upon each new execution of the program, and therefore of the situated and sensory inputs that can alter its evaluation of the reader.



Above, the egg_evaluator program asks Mašinka about her reaction to news headlines, CCTV images and star sign assertions about her current mood and future activities.

Mašinka's language is analysed:

Mašinka writes her own response to images and ideas put to her by the system.

Language analysing agents try to gauge her 'cognitive' style by looking at her vocabulary.



'I feel cold and romantic when I look at this image, it reminds me of home', (Mašinka, May 2009).

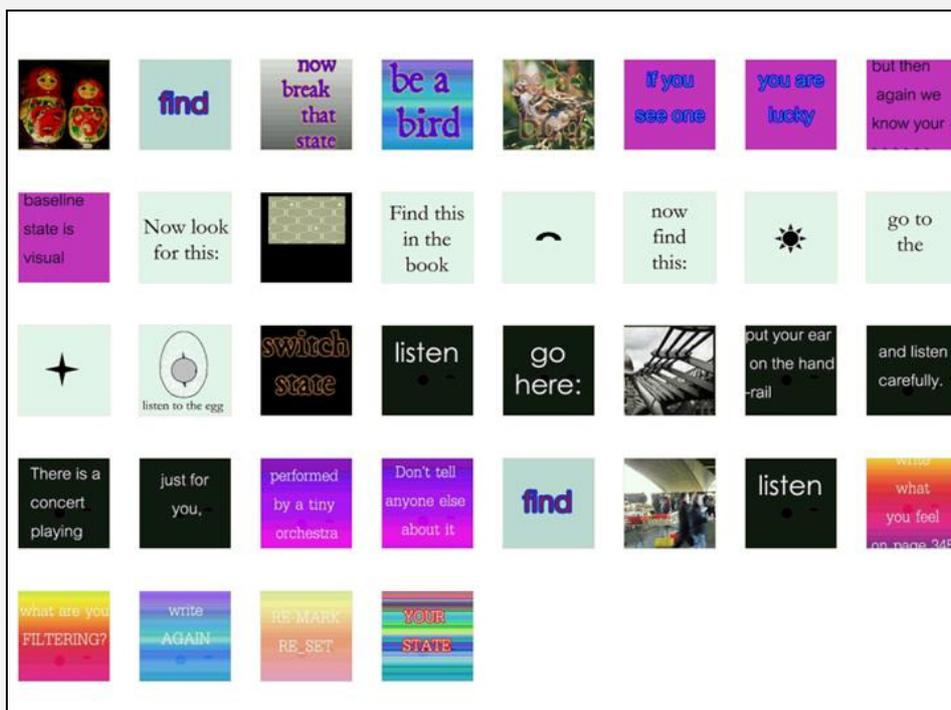
Content generation



Above, the *South* egg displaying content.

When the initial two stages have been completed the system is ready to generate content for Mařinka's egg. The `egg_content_Generator` program will assess all the information that earlier programs and their agents have generated, this data has been stored and made available to the `egg_content_Generator` in a simplified variation upon a blackboard system, in which agents update a common knowledge base.

Below, bespoke content generated for Mařinka in the form of image files, these are loaded into the egg from her laptop via a USB cable.



The egg content is designed to both complement and challenge her 'cognitive styles', suggesting exercises that open up new ways of interacting with the South Bank location, and new ways for Mašinka to generate knowledge of both the area and of herself.

Mašinka, the Moon forges a series of excellent angles with a host of different planets today, but for you this could see you thinking a little more deeply about life and being less concerned with relating with others, as much as tuning into your own needs.

Above, bespoke content generated for Mašinka by scraping star sign readings from the web

Mašinka is also told about her star signs for that day, and asked to try to act significantly upon this information while pursuing a specific task; today she is asked to observe the apartment blocks beside the Tate Modern, and to note the furniture and fittings in these homes, what can she deduce about these people by looking into their rooms? She writes a short narrative about a man she has seen in one of the apartments:

The man in the apartment is in such a hurry, he opens one of those trouser press machines and puts the trousers in a small suitcase. To see this makes me feel lonely and almost desolate. His flat is so empty of soft things; there are few photographs or pictures or cushions or nice curtains, instead he has metal blinds and a metal framed mirror. I am reminded of my worst times. I want to look away, at the sun or at trees or anything that is alive and hopeful.

(Writing generated by Mašinka, May 2009)

More content examples

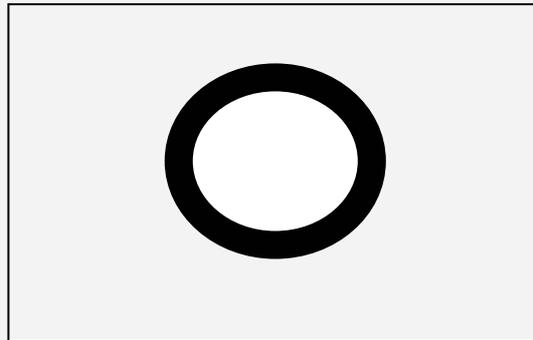
Below, among other features the system observes Mařinka's use of language during the evaluation process and reflects upon it in order to generate appropriate, bespoke content for the egg:

Mařinka

you are a
reticent
extrovert

Does this
make
sense?

The system goes on to suggest that she could try to be a *loquacious introvert* like Ivan Dâr. Mařinka is instructed to go to the Festival Terrace and enact such traits while re-tracing some of Ivan's steps in his journey to find the South-East pole or *Axis Mundi*.



Above, via this symbol, top, (which she must find in the South book) Mařinka is instructed to read a passage in the *South* book that is relevant to this instruction, the passage also contains further instructions.

Below, the egg displays a picture of a nose:



and a picture of a tongue:

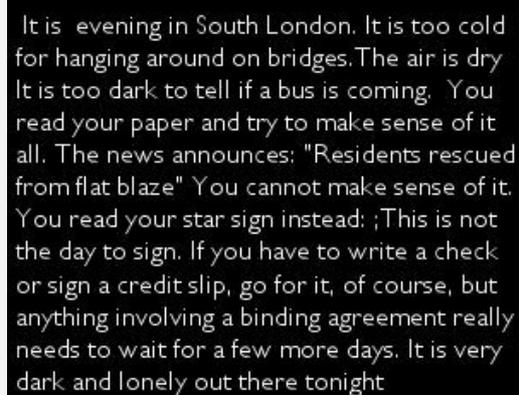


The cognitive styles or ‘representational systems’ Mašinka deploys are divided into sensory categories: visual, auditory, olfactory, gustatory (taste) and kinaesthetic (feeling, both emotional and tactile). These help the system to identify appropriate tasks, adventures and narrative experiences for her.

The egg tells Mašinka that her representational style is lacking in the gustatory and olfactory qualities so beloved of Ivan Dâr and suggests she visits the part of the South Bank that was once infamous for it’s so-called ‘stink industries’. There she will itemise the smells she can identify and relate them to Ivan Dâr’s theories about sensory signals as aids to spiritual navigation. She is also instructed to find an item that tastes sweet and an item that is **Umami**, a Japanese taste quality that Ivan believed was significantly non-binary and mystical.

Post-hoc explanation systems:

When *South* does use post-hoc explanation systems, it is generally because the agents concerned are not 'characters', but analytical agents interpreting CCTV images and situating data, hence the narrative of their conclusions does not have to be framed in anthropomorphic or zoomorphic terms.

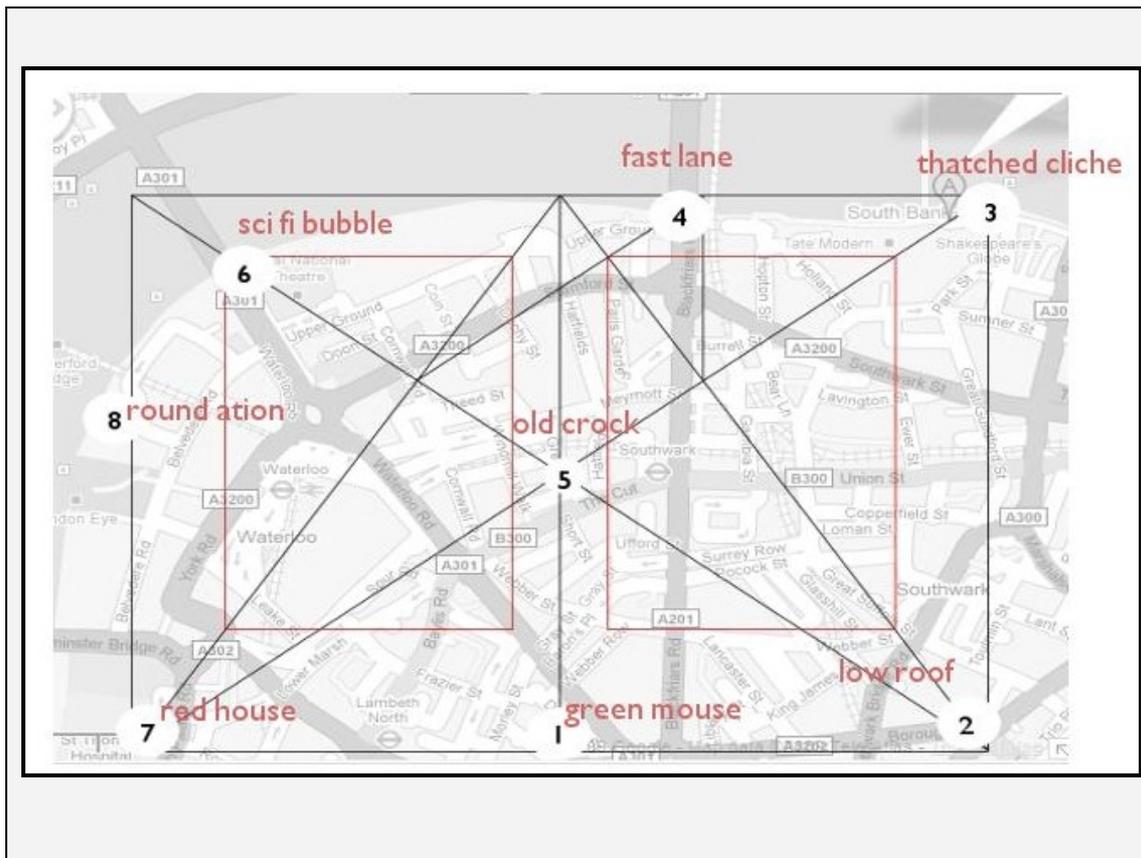


It is evening in South London. It is too cold for hanging around on bridges. The air is dry. It is too dark to tell if a bus is coming. You read your paper and try to make sense of it all. The news announces: "Residents rescued from flat blaze" You cannot make sense of it. You read your star sign instead: ;This is not the day to sign. If you have to write a check or sign a credit slip, go for it, of course, but anything involving a binding agreement really needs to wait for a few more days. It is very dark and lonely out there tonight

Above, narrative generated by analysis of CCTV, news headlines, weather and reader behaviours.

The agents concerned with evaluating CCTV images, detecting duplicates in language segments, evaluating news headlines and weather information generate such explanations. The agents that represent Ivan Dâr frame their responses and the rationale for them in pseudo-anthropomorphic terms.

Following page, a map in the *South* book works in conjunction with the egg content, the software has an internal model of the map and can therefore make meaningful instructions for readers to put themselves in particular locations. Readers generate new names for the locations each time they use the software:



Outcomes

It was certainly an unusual experience. At times it did feel like the egg was addressing me as a real person, but it also had strange ideas and made me do things that people wouldn't usually do on a day out to London! Such as talking to fish in the London aquarium and going round smelling everything. I am interested in writing so I really enjoyed the writing exercises, this could be useful as a general tool for dealing with writing blocks and for generating new ideas. I will do it again in the winter, and maybe when I am in a bad mood!

(Mašinka Savić, July 2009).

Mašinka has experienced a range of evaluations or psychometric exercises and additional tasks to help the system assess her current moods and subjective states. These tasks were based around her sensory responses as well as situating data that the *South* system had retrieved and analysed prior to her evaluation. The various agents embedded in the *egg_soft* collection worked both behind the scenes and on-screen to aid Mašinka in experiencing a meaningfully bespoke range of narrative experiences, these experiences were communicated to Mašinka via a set of images that she loaded into her egg device and also through pointers to relevant passages in the *South* book. If Mašinka could be conceived of as an 'environment', then the egg device or *effector* was agential in that it was able to change that environment via the tasks it gave her. Mašinka took the egg and the book to the South Bank and followed the egg's instructions, some of these instructions effectively changed Mašinka's mood and her knowledge of both herself and the location. Another outcome of her interactions as outlined in chapter four (the *South* book chapter) is that future editions of the *South* book will include her written and visual contributions.



Figure 56 Above, toy robot, collection of E. Dare.

6.4 Conclusions

Narrative has multiple meanings and the construction of narrative presented within *South* is a complex, interdisciplinary system, congruent with the description of

narrative outlined by Mateas and Sengers, as a ‘family resemblance concept, a cover term for a rich set of ideas’ (Mateas, Sengers, 2003: 21). The agents embedded in the *South* software accommodate a similarly rich set of epistemological practices with which they engage critically and playfully. In particular the *South* agents interrogate the rationalist traditions that underscore symbolic AI, offering alternative and meaningful challenges to the orthodoxies implicit in those practices. Alison Adam writes of how symbolic AI assumes that the ‘subject need not be made explicit’ (Alison Adam, 1998: 179), but in the narrowness of its implicitly rationalist subject, whom Adam also frames as an implicitly gendered, ‘man of reason’ (179), the possibility of an embodied and situated epistemology is also lost.

South’s agents have been constructed with a view to offering a broad range of epistemological and subjective positions, asking what other types of knowledge agents can work with in addition to the conventional schemas proposed by *a priori* and formal representations. The epistemologies *South’s* agents initiate (in addition to propositional forms of knowing) are rooted in subjective, embodied and situated experience. As evidenced in the case study presented in this chapter, the *South* agents generate tasks that test the means and the degree to which knowledge can be codified or articulated, either inter-subjectively or between humans and computers. Readers discover for themselves the extent and means by which they can codify what they know but also the extent to which a software agent can understand something as complex and fluid as a human subject.

In working with agents *South* has also emphasised cultural situatedness as well as the physical, sensory or environmental situatedness conventionally implied by computer scientists when they refer to ‘situated agents’. By situating themselves in a dynamic network of environmental, cultural and inter-subjective forces, and thus establishing a less linear foundation for interactivity, the agents deployed in *South* are able to destabilise and meaningfully interrogate its core themes of subjectivity, epistemology and agency. The reasons for engaging in such an interrogation are both pragmatic and ethical.

My rationale in looking for alternative subjectivities, epistemologies and agentic distributions has been rooted in the premise that electronic literature is in a significant crisis (as outlined in the introduction to this thesis) and that this crisis is symptomatic of electronic literature's provenance in rigidly symbolic, *a priori* knowledge representations. These rigidly top-down and pre-determined representations have often resulted in stilted and predictable works that do not deploy contemporary, networked computation optimally. At the same time, broader, more relational framings of agential and epistemological processes are part of a methodological commitment to a multiplicity of perspective. In keeping with the tradition of artist's books the materiality of specific practices is also emphasised, and in that emphasis a tendency to anthropomorphise or zoomorphise agents is counteracted in favour of allowing agents to 'be themselves' through the particularity of their medium. An emphasis on medium specificity and the other key outcomes and inferences I have formed in producing the *South* agents are listed below.

Key outcomes and inferences:

- **Medium specificity also applies to AI practices:** Such practices are specific mediums, not unlike *dramatis personae* with their own unique traits, capabilities and flaws. Many of these qualities would, in anthropomorphic terms, be framed as 'mal-adaptations'⁶⁶ by agents to conditions beyond their 'ecological niche'. But such mal-adaptation is arguably an inherent feature of all agents, whether human or non-human, and as such a potentially creative resource.
- ***South's* agents are also proxy researchers:** The agents embedded in *South* engage in research on my behalf, we might therefore be described as *structurally coupled*.
- ***South* agents are non neutral:** *South* and its deliberative agents deny the assumed objectivity of the Cartesian 'man of reason'; the embedding of non-

⁶⁶ In evolutionary terms a mal-adaptation, (or behaviour that makes survival in a particular environment less likely) is also an inevitable side effect of advantageous adaptation, for example, Dodos became fat to accommodate periods of famine, but this adaptation made them ill-suited to evading human predators.

neutral values is revealed via *post-hoc* explanation systems and access (where they exist) to knowledge bases.

- **The *South* system is supported by an ethical methodology:** *South* aims to establish a plurality of practices and to accommodate a similar plurality of agencies.
- **A ‘situated agent’ is also a culturally situated agent:** As Mateas and Sengers have argued (2003) AI systems are cultural artefacts. They also argue that agents perform on behalf of their authors; these ideas are investigated throughout *South*.
- ***South*’s subjects are framed as environments:** There is a meaningful degree of what might be called *structural coupling* or mutual influence, between the *South* agents and their environments (readers), but this mutuality is intended to extend beyond the binary, linear relationship, implied by the word *coupling*.
- ***South*’s agents are allowed to be graceless:** Agents generate subjective weightings upon each new execution of the program, supported by situated and ‘sensory’ inputs that can alter the agent’s evaluation of the reader, this has some resemblance to simplified machine learning algorithms, in which agents observe situations and interactions and attempt to detect patterns in order to act upon them. Janet Finlay and Alan Dix write that ‘issues of control and grace of interaction between agent and user are common to any system that involves learning user actions’ (Janet Finlay and Alan Dix, 1996: 233). However, *South* is also interested in contesting orthodox notions of interactivity, and thus of exploring what a ‘graceless’ system might be like, whether in fact there are power struggles or creative asymmetries at play.
- ***South*’s agents are embodied:** But to talk of embodiment in relation to wholly software agents is complex and contested.

The final statement acknowledges the difficulty of describing *South*’s agents as embodied. These artificial agents do not have a direct physical presence in their environment (aside, perhaps, from the phosphorescent physicality Hayles writes of

(1999)). However, my agents are, in extended terms situated in their environments, which I define as the subjectivity of the *South* readers, the computational environment and the more conventional sense of an environment represented in my system by inputs relating to tidal flows, weather patterns, atmospheric pollution and temperatures. I would therefore venture to define these agents as both physically and artificially embodied by virtue of a meaningfully dynamic relationship to their environment. Computer scientists might characterise this as a form of *structural coupling*. Such a structural coupling, however, as outlined for example by Maturana and Varela (1987), suggests a loop of agencies, in which the artificial agent effects the environment (a reader) and the environment, or human agent effects, in turn, the artificial agent. The idealised conception of the *South* system aims to be looser, less linear than the notion of structural coupling or loops of cause and effect might imply. *South* attempts to open its structural relationships to a wide and distributed network of agencies, including human agents, such as readers and myself, artificial agents and other types of non-human or hybrid agencies, from forces of nature to economic forces that have complex agential foundations.

The following, and final, chapter will expand upon both the limitations and possibilities inherent in the *South* project and its agents. It will make the case for the originality of both the *South* book and software and for the broader notion of subjectively and environmentally situated programming. The conclusion will relate the solutions I have devised to the research questions and aims outlined in the introduction to this thesis.

eleanor, the software
says this to you:
leisure time is
a gigantic
smoke screen

Figure 57 Subject-specific content generated by the *South* software.

Chapter 7: Conclusion

We confront our own opacity through these artefacts – or rather, we co-become with them to inventively make problems about what ‘we’ might become.

(Beaver et al, 2009: 6)

When my PhD practice started in October 2007 there was a long list of questions that I wanted to explore. These questions were expansive and complex and yet I

found them energising, they were relevant to my ongoing practice as a fine artist working with both computational and analogue materials. It felt that attempting to answer these questions would generate the type of situated and dynamic art-works, specifically artist's books, which I had long wanted to experience but had not yet encountered. These questions were:

- Can the artist's book be meaningfully remediated within a computational framework?
- Can computers generate both fictional and non-fictional writing?
- Can they also understand their readers and generate worthwhile insights into them?
- To what extent must computer programs depend upon *a priori* rules and how rigid do those rules need to be?
- Would it be possible to create a computational artist's book that reacted to people dynamically and interestingly?
- Does electronic literature have to be 'Aristotelian' in form?

In the complex and rich domains of HCI, electronic literature and artist's books there were no pre-fabricated methodologies to help answer these questions. Throughout the last three years it has been necessary to invent my own strategies and methods in order to tackle these questions and to establish meaningful solutions and findings. This thesis conclusion will establish the significance of those findings; it will summarise how I have dealt with the research problems outlined in the thesis introduction. The conclusion will also acknowledge the inevitable gaps and contradictions embedded in aspects of the knowledge I have generated, as well as the possibilities that this research (including those gaps) has offered for further investigation. These include the four projects I am currently engaged in and the proposals generated via my involvement with the Goldsmiths Research Incubation Transfer (GRIT) program, in which concrete and feasible propositions for projects that extend this doctoral work have been developed.

This conclusion synthesises the key terms and concepts represented in the thesis. It articulates the re-conceptualisations that the thesis proposes, framing them as significant contributions to the field of both electronic literature, arts computing, and HCI (Human-Computer-Interaction). These closing deductions are drawn in light of a critical reading of the relevant literature and a practice-based engagement with inter and *intra* active writing and the broader domain of HCI. This conclusion outlines how the thesis findings have been disseminated and received within a wider research community, referencing several collaborative and independent projects, papers and presentations that I have undertaken in London, Bradford, Copenhagen, Berlin and Stockholm. These papers and projects support the claim that my PhD practice has generated viable solutions and valid methodologies, and that these have been acknowledged within a broad community of researchers and arts practitioners.

The first section will now summarise and synthesise the main concepts presented within the thesis, while the subsequent sections will clarify the significance and contribution of this PhD, relating it to background readings and bringing closure, where it has been possible, to the main thesis questions, while evidencing the possibilities for further research and knowledge transfer generated as a result of this intensive three year apprenticeship.

7.1 Summary

From the very start of my PhD research the formation of dynamic relationships between individual subjects and books was a central goal of my practice. In order to pursue this objective, my theoretical research focused upon ideas relating to subjectivity and by extension to issues of epistemology and agency. My background research addressed the question of what a subject is and how such an entity generates knowledge about the world. This research also addressed the question of agency, particularly in the context of configurations involving humans and computers,

asking what makes things happen in such a configuration, and where do subjects and objects begin and end? While these conceptual questions have been central to a philosophical understanding of the field, I have also had to formulate real-world, pragmatic solutions that work with these concerns. These solutions are co-constituted from both theoretical and practice-based knowledge; the theoretical and indeed ideological principles I have researched and formulated are enmeshed with the materiality and specificity of mediums, as well as my own subjectivity and situatedness. The solutions that have been generated in response to the overarching aims of my PhD practice are summarised below:

Aims

- Create dynamic relationships between humans and books.
- Produce a digital and analogue artist's book that tries to understand human subjects, even if that understanding is flawed by asymmetries of understanding between computers and humans.
- Make the software and book as reflexive, situated and transparent as possible.

The entanglement of practice and theory described above has arisen from formulating aims that demand real-world solutions. What, for example, might a computer program be like that concurs with Bourdieu's notion of being *in-the-game* (Bourdieu, 1990), 'in moving beyond traditional objective/subjective binaries that have tended to separate the arts and humanities from the sciences' (Jefferies, 2009: 5). How, specifically, does one generate workable programming structures that encompass the subjectivity and relationality of knowledge and the particularity of experience? At the same time, how might such a program acknowledge the broader structures and situating agencies at play in any computer-human configuration? As this conclusion will emphasise, the significance of my PhD practice is evidenced in the way these issues have been tackled and by formulating workable solutions in relation to them.

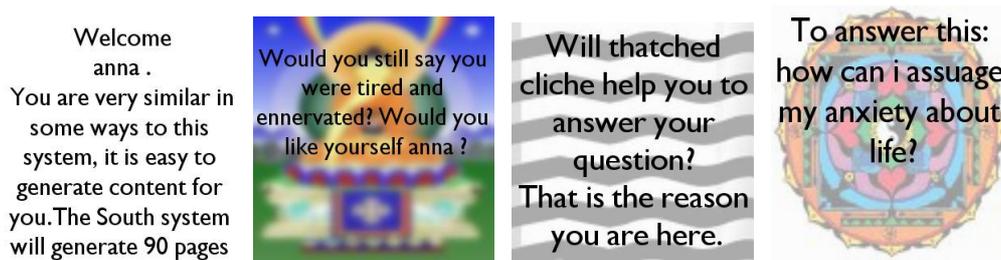


Figure 58 Above, examples of subject specific content generated by the *South* software

Throughout this thesis subjectivity, agency and alternative notions of the *inter*, or rather, the *intra*-active have been referenced. The thesis has also discussed the notion of the artist's book and related it to the less familiar and less documented conception of digital or even 'intelligent' books. In keeping with the tradition of many artist's books, (though at first not consciously so), it has been the specificity of the computational mediums and structures I have deployed that have grounded my practice, combined with a pragmatic engagement with situatedness, intra-activity, agency and subjectivity. I have deployed these key concepts and terms not merely as catch phrases or solely as ideological constructions, but as the central tools for answering the thesis questions and for producing software.

Main question

The main question: 'How can subjectivity be reconfigured within software that generates dynamic, intra-active, artist's books?' is embedded with the core conceptual and pragmatic goals of the *South* software and book. By working critically with the notion of the subject and by allowing a high degree of questioning and exploration to enter into the framing of the subject within this work (in both its analogue book and software book forms), an alternative notion of interactivity is also conceived. The *intra*-active software I have written, as its name suggests, encompasses a multi-linear form of computer-human configuration as opposed to the linear causations stereotypically at play in the construction of the *inter*-active. The etymology of these words reveals their different agential emphasis: *inter* – means between, while *intra* means within. The *South* software seeks relational agencies in making its decisions. These agencies, though often asymmetrical, do not favour the

human over the computational or the environmental over the subjective; they do not presuppose an *a priori* separation between the subject and the object. Instead *South* frames such separations, if they do exist, as contingent to the specificity and locatedness of particular factors, in both their spatial and temporal situatedness.

The emphasis upon the temporality of human-computer configurations is a significant response to the research aims and a key conceptual aspect of the intra-active structures formulated in response to the thesis questions. The solutions presented through this work are offered here as significant contributions to a re-conceptualisation of both interactivity and previous artist's book forms. In support of this claim I would like to refer to an exhibition that was held halfway through my PhD in the spring of 2008. The exhibition was entitled *Blood on Paper* and was held at the Victoria and Albert Museum⁶⁷ (from the 15th of April to June 29th, 2008). The exhibition professed to represent the current state of Artist's Books, aiming to 'show the extraordinary ways in which the book has been treated by leading artists of today and the recent past' (V&A *Blood on Paper* website, accessed 25/11/09). While I am not disputing the fact that many of the works in this exhibition were extraordinary, innovative and important, it also seems significant that there were no computational book-works on display and no reference to the possibility of such works, indeed no digital exploration of the book form was included. The website for the V&A artist's book collection also makes no reference to computational artist's book forms, rather they are presented as anathema to the form and somehow irreconcilable or threatening to analogue books. The possibility of remediation or a more nuanced, non-polarised interplay between analogue and digital constructions is also not considered:

At a time when the notion of the book is challenged by the advent of the screen and computer, this exhibition aims to show the extraordinary ways in which the book has been treated by leading artists of today and the recent past. *Blood on Paper* will focus on new and contemporary work and on books where the

⁶⁷ V&A Web page describing the exhibition available here: http://www.vam.ac.uk/collections/prints_books/features/artists_books/definitions/index.html
Accessed 25/11/09

artist has been the driving force in conception and design. The past twenty years have seen outstanding work by some of the most influential and respected artists of our time.

(Web site for the *Blood and Paper* exhibition:<http://www.vam.ac.uk/collections/contemporary/bloodandpaper/index.html>)

The background reading outlined in the literature review articulates the apparent scarcity of technologically significant, computerised book forms; this is also supported by other forms of research, such as the disassembly (or *reverse engineering*, where legal) of existent digital forms. Though there are certainly many interesting works at large, there have arguably been few works that significantly deploy computational structures and medium specificities in the way that book artists have historically interrogated analogue book forms. Likewise my reading supports the claim that much of the work (with some striking exceptions referenced in the literature review) described as *digital* or *interactive literature* is also not fully engaged with the evolving specificities and dynamic potential of computational structures or the social, historical, aesthetic and ethical implications of HCI. This is not a prescriptive statement; clearly not all writers are concerned with exploring the full potential and implications of digital forms. This thesis does not aim to establish an orthodoxy stipulating what writers engaged with digital processes 'should' be interested in. However, in addressing the problems identified in the literature review for this thesis, an important recommendation is the meaningful application of computational resources in a way that creatively deploys their specific capabilities.

The next section will expand upon the significance of the background reading, drawing upon its key aspects and exploring the ways in which my own findings have concurred with or contradicted the ideas found in these works.

The literature

The background research was structured according to the core themes of subjectivity, agency, epistemology and electronic literature. In the case of electronic literature the tools I have developed do address some of the failings and assumptions embedded in previous writing systems and their outputs, as identified for example by Aarseth (1997), Tabbi (2002) Sengers and Mateas (2003) and J. Yellowlees Douglas, (2000). However, though these critiques have formed a vital foundation for understanding this field, my emphasis departs in some important ways from the main themes of these works. Identifying and highlighting the asymmetries and potential misunderstandings inherent in differing epistemologies (such as rule-based computational knowledge schemas or the tacit, embodied and situated knowledge of human subjects), has been one of *South's* core strategies.

In keeping with the works cited, the asymmetries of understanding between computers and humans could be problematised, but instead they are deployed in *South* as sources of productive tension and creative possibility, much as human character flaws are deployed as core individuating and motivating elements in many fictional works. Likewise, though Mateas and Sengers (2003) do address the issue of partiality, and the positivist fallacy of neutral computation, an important conception in this work is the creative articulation of both my own and my reader's subjectivity via the *South* software and book. This, I assert, is a distinctive facet of the *South* project and an original contribution to the field of interactive narrative and artist's books. Both subjectivity and epistemology are framed as fluid agencies in the continuous co-becoming intrinsic to the notion of an 'intra-active' book.

Subjectivity

Research into subjectivity and the notion of a stable, originary, subject has opened up a significant, and it must be said, an intrinsically problematic area of tension within this work. Whereas the psychometric tests I have drawn upon largely seek to ignore the philosophical tensions at play in a fixed, predictable, *a priori* model of the subject, the *South* book and software opens up these unstable structures for further examination. The uncertainties and historical framings of the subject are presented in

South, not as inconvenient variables, but as rich sources of creative potential. The types of possibility held in these conflicts and contradictions are transformed into forms of potential literature, potential sources of temporally situated agency and potentially performative explorations of the subject.

Background reading into the use of psychometric (or personality measuring) mechanisms has left an impression that the critiques of such forms (particularly those of Hollway (1984) and Henriques et al (1984)) do not fully answer the question of why these tests and these notions of testable personality types endure (and why many organisations still spend money performing such tests). Rather than fully concurring with these critical works and rejecting outright the notion of static personality traits, the *South* project addresses these paradoxes, providing novel mechanisms for readers to formulate their own theories about the stability or otherwise of personality traits and their own subjectivity. This also represents an ethical commitment to identifying unhelpful polarities, or examples of 'either/or' thinking, in which readers would be forced (or encouraged) to take an entrenched view of these issues.

Epistemology, agency and situatedness: how do subjects and objects generate knowledge?

At first sight Sandra Harding's notion of standpoint epistemology (Alcoff and Potter, 1993) seemed to offer attractive alternatives to the problems inherent in universalising knowledge claims, and may have presented a solution within *South* to the difficulty of reconciling generalisable knowledge claims with subjectivity, and yet the idea of privileged standpoints seems ultimately to open further ethical and pragmatic difficulties. More workable conceptions of both the subject and agency are accessible from writers who engage with the contingency and temporality of 'meaning'. Barad (2007) describes a complex but pertinent sense of the continuous, ongoing, unfixed process of differentiating subjects from objects. There are also further useful critiques of fixed representations available through primary and secondary readings of Henri Bergson (1911), and, though their arguments address different issues, readings of Dreyfus (1972, 1992), Adam (1998) and Suchman (1987,

2007) have been essential in supporting a critique of *a priori* representation, but it should also be stated that I have not taken an entrenched position on this matter in my own programming. There *are* rules (or *a priori* representations) within the *South* system. As Suchman has done (2007) I would also defend myself from the suggestion that I am proposing we abandon all plans or prior structures in interactive programs or that it would be possible to do so.

The core issue in my work concerns the degree of *a priori* planning necessary and the flexibility or otherwise of such structures in my computation. *South* should be framed as providing tools for an exploration into these distributions and to our ongoing understanding of human-computer-interactions. In both its software and book forms the project presents flexible apparatus for negotiating and testing these relationships. The following section will clarify the significance, originality and contribution that these solutions make within the domain of computational literature and the broader areas of both artist's books and HCI.

7.2 Deductions and solutions, significance and contribution

Alternatives to rigidly predetermined and unvarying interactive software programs:

The *South* project has resulted in alternatives to rigidly predetermined and unvarying interactive software programs. It fosters a tolerance of both complexity and multiple interpretation, while bearing in mind that 'designing systems to support a rich range of interpretations does not abdicate the designer from responsibility for the eventual success of the system' (Gaver and Sengers, 2006: 7). Environmentally and sensorily situated programming sustains a creative sensitivity to the temporally and socially entangled agencies that are always at play in complex systems of human-computer communication. Using environmental factors (such as the tidal flow of the Thames, meteorological data and CCTV images of London's roads) as logic gates within the

South software, has enabled the *South* project to maintain and emphasise a networked rather than a top down, centralised system. Giving readers the opportunity to ‘hack’ into and change the *South* software also emphasises a contingent as opposed to a rigidly rule-based, black-boxed system. Similarly this practice deploys subjectivity and subjectifying processes as a form of situating resource, or an expanded notion of an ‘environment’, while inviting readers to decompose and renegotiate the fixed models of the subject potentially present in the hard-coded sections of the *South* project.

Figure 57 Below an algorithm from the software that uses string matching to evaluate information about the weather at the time of interaction, following page, a screen shot from the *South* software.

```
/**
 * evalWeather() read in weather data, split string
 *
 * @param String
 * ss, String actions, int aa, int bb aa and bb = location of
 * text to print actions = text to print ss = String to match
 * @return void
 */

public void evalWeather(String ss, String actions, int aa, int bb) {

String weth = readText("web_Gather/weather/weather");

String a = " ";
String[] list = split(weth, " ");

//make into general method for matching

    for (int i = 0; i < list.length; i++) {

        a = list[i];
        if (a.equals(ss)) {
            text(actions, aa, bb);
        }

    }

}
```



Figure 60 Content generated by the *South* software.

Situated agents

The notion of ‘situated’ agents is referred to in much of the background literature concerned with software agents that has been researched, however the meaning of *situated*, in for example Brooks (2002) and Wooldridge (2009) is not the same as my own interpretation of this concept. Brooks situates his robots (such as ‘Genghis’) in their immediate environment, where they can react to the presence of walls or other objects, describing them thus: ‘A situated creature or robot is one that is embedded in the world, and which does not deal with abstract descriptions, but through sensors with the here and now of the world, which directly influences the behaviour of the creature’ (Brooks, 2002, 52-52). *South*’s agents are situated in a much broader physical and social sense that is closer to the situated knowledge(s) described by Haraway (1991), Suchman (2007), Barad (2007) and myself. Haraway describes situated knowledge(s) as a form of embodied objectivity that accommodates ‘particular and specific embodiment’ (Haraway, 199: 190). Acknowledging and making visible our partiality of perspective in Haraway’s terms is taking ethical and scientific responsibility for the knowledge we generate.

This wider sense of situatedness in the *South* software is supported by a range of techniques and factors including web scraping, observing reader actions, analysing news headlines, my own subjective data, and environmentally situated ‘percepts’ or sensors that detect weather, financial and tidal states. The subjectivity of readers is

also framed as a situating factor in a sense that departs in some ways from Suchman's conception of situated programs. The *South* project frames subjects themselves as forms of environment, including my own subjective presence within the software structures I have written.

Relational agents and knowledge generation:

The *South* software is built around a series of agents which perform analytical and interpretive tasks. A commitment to a reflexive practice emphasises the exploration of the proxy and in many ways subjective role these agents play on my behalf. Consequently the agents are both structural tools and unorthodox protagonists within this work. The limitations inherent in these agents, and the asymmetries of understanding between them and human readers, are framed as creative resources. The rigidity of computational language analysis is framed as a 'cultural' trait. The awkward yet amusing efforts of computational agents to understand the input of human readers is preserved rather than smoothed out by an endless regress of rules or ready-made language structures. All of the agents engaged with *South*, whether human, computational or environmental, challenge the notion of autonomy, instead they collectively engage in a form of continuous, dynamic co-becoming.

The *South* book and software supports an explorative engagement with different forms of knowledge generation. The 'sensory modalities' of readers are identified by the evaluative software and are presented as a challenge or provocation to readers, who are invited to explore the validity of this categorisation. Readers are also guided through a range of epistemological engagements, from rigidly pre-set rules to embodied explorations that are embedded in the physical and cultural terrain of the South Bank area. I will now outline a representative sample of the ways in which these ideas have been disseminated within the wider research community, supporting the argument that they represent viable, valid and original contributions to my field.

A sample of papers, projects, presentations, installations and performances:

- London, Goldsmiths February 15th 2008: 'Non-linear narrative in twentieth and twenty-first century artistic practices', this was a symposium between doctoral students from Goldsmiths, Berlin and Copenhagen Universities. My paper, entitled 'Questionable Texts', outlined an ethical and pragmatic case for situating interactive fictional works in the subjectivity of the programmer-writer. I also demonstrated *Subject Oriented Software*, a prototype Java interface using xml files to enable readers to 'question' and to situate the short stories embedded in my computer program.
- Copenhagen University, June 2008: 'Copenhagen Symposium on Art and Research: New Interfaces': Following on from the previous presentation this paper, 'Subject Oriented Software', expanded upon the use of my own subjectivity as an ethical and situating factor by describing the ways in which a new version of the software could accommodate the subjectivity of readers, and also of wider situating events, through web scraping and the monitoring of reader interactions. The paper also acknowledged the possibility of mutable subjects and entangled agencies, offering a theoretical critique of originary, trans-historical subjects.
- London, Goldsmiths, November 20th 2008: 'The Thursday Club', Goldsmiths Digital Studios. Supported by Goldsmiths Graduate School & the Department of Computing. This involved a presentation with Alexandra Antonopoulou. My part of the presentation was entitled *Cybertexts*. The presentation discussed the dangers inherent in imposing naturalised literary terms onto new forms of textuality, showing how my own work is concerned with the

specificity of different mediums. I also discussed the place of the subject in digital literary works, asking how relevant long-held ideas of agency and 'reception' are in the reader-writer nexus within a dynamic and networked writing system.

Details available at:

http://doc.gold.ac.uk/~ma701pt/thethursdayclub/?page_id=14

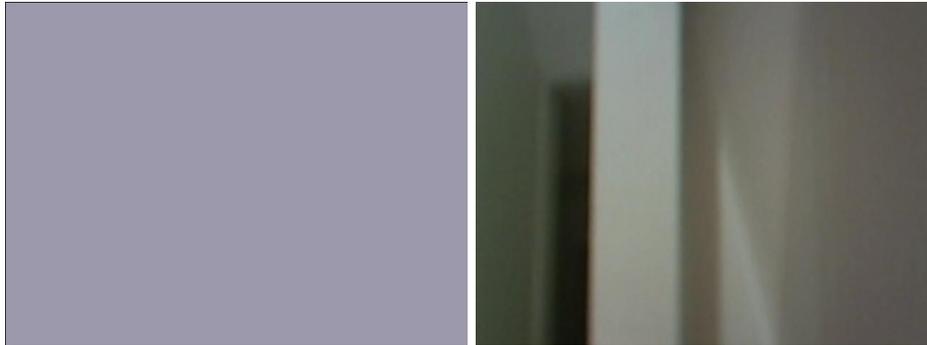
Accessed 29/11/09

- London, Goldsmiths 24th September 2009: My methodology was presented to the new practice-based Goldsmiths PhD cohort. The case was made for a non-passive research design that uses self-reflexive journals and embodied knowledge generation (see page 122 for more detail about these practices). The *Kavad*, or mobile methodology box was also presented as a processual and evolving tool for investigating and developing a practice-based methodology and matching it to appropriate methods.
- Berlin, Freie Universität, Graduiertenkolleg "InterArt" International Research Training Group "InterArt Studies". 16-18 November 2009. Alexandra Antonopoulou and I presented a paper, our artist's books and an installation. Our paper, entitled 'Phi Books Research Territories through Narrative' presented our work as a partly fictional, visual and sonic performance. In keeping with my PhD methodology the case was argued for fiction writing as a valid research process, balancing determinism with subjectivity through the use of an algorithmic approach to collaboration and to artist's book production. Our installation solicited writings from the participants. These writings were re-incorporated into new editions of our artist's books and an online journal. The *Phi Books* journal is available here: <http://phibooksland.blogspot.com/>
- Stockholm, the Research School of Aesthetics at Stockholm University, February 2010, symposium on 'Aesthetics and History'. I presented my paper

Robot aesthetics and analogue interventions: humans and machines in the incunabulum'. The paper expanded upon some of the themes discussed in chapter six of this thesis, relating to robots and software agents. The paper recommended the need for exploring a computational aesthetic for software agents and electronic literature, and for producing programs that both tolerate and exploit the ways in which computers try to comprehend natural (or human) language, framing then not as misunderstandings, but as an emerging aesthetic or 'robot literary culture'. I also presented a 'live' *robot play*. This play was computationally embedded in the environment in which it was presented, responding dynamically and uniquely to the moment of its performance.

- London, March 2010, Goldsmiths University of London – Inter-Art symposium with Berlin and Copenhagen Universities. Alexandra Antonopoulou and I presented a paper and our films, which are called the 'Phi Meta-films'. My own film was embedded in a computer program I wrote in the Processing programming language. In keeping with the methodology developed for my doctoral work the film was situated and dynamic, responding to the specific temporal and social agencies at play at the moment of its screening, and also mixing 'live' images of the audience back into the original film during its screening. This paper proposed and performed a rigorous engagement with the expectations and meanings of *audience participation* and collaboration.

Figure 61 Below, screen shots from the *Phi MetaFilm*, the colour on the left was the colour of the river Thames sampled from CCTV at the time of the film's screening.



Bradford, May 2010, *Graffiti Sounds*, a project directed by Shabina Aslam, involving site specific sonic narratives created by marginalised teenagers in Lister Park, Bradford. My *writing maps*, or heuristic tools for generating writing, were used in workshops to help the participants generate material for this project. I designed and edited a book to accompany the project, containing materials generated by the participants. The project is funded by *Media Box*. (<http://www.media-box.co.uk/about/what-is-mediabox>).

Figure 62 Below, 'writing maps' produced for the *Graffiti Sounds* project, March 2010. I used the idea of articulated subjectivity as a heuristic or writing tool for teenagers in Bradford.



- September 5- 8th 2010, a collaborative paper presented with the curator Lee Weinberg at the Brunel University *DRHA 2010 Sensual Technologies: collaborative practices of interdisciplinarity* conference. Our paper was about VAINS, the *Visual Art Interpretation and Navigation System*. The paper was peer reviewed by a panel at Brunel University. VAINS involves the construction of

an online gallery that reacts dynamically to individual visitors, enabling them to make and preserve radical changes to the gallery design and content. The project is an opportunity to extend my ideas about situated, bespoke and subjectively grounded computation. The Website for VAINS is available here:

http://www.wix.com/Vains_Pro/VAINS Accessed 12/09/10

- November 2010, the 8th International Conference on the Book, St Gallen University, Switzerland. I will present my paper 'Post-desktop publishing: *future books in an era of ubiquitous digitality*. The Implications of intelligent and pervasive book forms'. The paper is about my PhD Research.
- June 2011, the 14th Annual International Creative Writing Conference, Imperial College, London. I will present a paper on *South* These papers, projects, presentations and artworks represent the means by which a well structured methodology has helped answer the core questions presented in this thesis and further questions proliferating from my research, such as issues of 'creative' collaboration and *a priori* constraints. These activities evidence the ways in which the main aims have been met while acknowledging the processual and evolving nature of this work. These papers and artworks have specifically contributed to the resolution of issues relating to the construction of a dynamic and situated artist's book. This book can be characterised as significantly intra-active, original and therefore a work that contributes to the generation of relevant new knowledge within the domain of HCI and to meaningful new forms of artist's books. However, it is important to acknowledge the inevitable limitations present in this, as much as any other research project. The following section will elaborate on some of those limitations, identifying ongoing issues and relating them to problems that many researchers in this field continue to address before moving on to the final section which will discuss the possibilities for further research, some of which are related to the limitations identified next.

Limitations

Validity and generalisation

Chapter three of this thesis (the methodology chapter) identifies some of the complications many artists have articulated in relation to notions of validity and generalisation. There are useful responses to this question in Gaver and Sengers (2006), Wilkie and Gaver (2006), Sullivan (2005), Carter (2004), Penny (1999) and Wilson (1996). These authors support alternative logics of practice that do not polarise explicit and tacit forms of knowledge. In relation to the associated problem of evaluation I have embraced multiple interpretation as a response to my own critique of singular, idealised outcomes. Nonetheless it is reasonable to anticipate valid refutations of this approach. Perhaps the strongest rejoinder is to highlight the transfer I have affected from electronic literature to analogue text, to film making and teaching by means of my methodology. However I would pinpoint the question of validity and generalisation as an ongoing area of debate, particularly in the context of works that operate at the intersection of the arts, humanities and sciences. James McAllister (McAllister in Slager, 2004: 10) identifies networks of validity⁶⁸ that operate within the arts, comparing them to forms of validation found in scientific contexts. I have evidenced my own papers and artworks in support of the notion that this PhD practice has been validated within those extended networks and epistemic communities.

Order and chaos, subjectivity and fragmentation

The double bind of anchoring this work in subjectivity entails the benefits of an ethical and located project but also a degree of subject and site specificity that has the potential for narrative fragmentation. However, this thesis also challenges the validity of a universal interactive work. These issues are not straightforward or easily resolvable (and are not ones that I have significantly focused my energies upon). Instead I offer the intra-active program as a solution to the static and rigidly linear

⁶⁸ The *networks of validity* James McAllister describes are analogous to scientifically validating networks or laboratories. James McAllister boldly states that artworks do 'contain knowledge about the world' (McAllister in Slager, 2004:10) But, as he points out the networks of validation artists experience include other artists, 'galleries, curators, critics and so on' (11). McAllister suggests that 'communication of an artwork would also count as an empirical success' (12) but that research does not consist of 'think-pieces to accompany works of art or exhibitions. Rather the research exists in the works of art themselves' (12).

works critiqued in this thesis, while acknowledging that my own work must strike a very precarious balance between order and chaos, subjectivity and fragmentation. This is a balance that is not limited to my own output. Sophie Calle's exhibition (October - January 2009) at the Whitechapel Gallery, 'Talking to Strangers' exemplifies the delicacy of this balance and is a reminder that it is not one that is limited to my own practice. I would also identify Sophie Calle's work as grappling with the inter-textual, inter-medial and interdisciplinary, striking, as *South* aspires to do, a complex balance between literary, narrative elements and less easily graspable features, such as visual documentation, performance and speech fragments.

'Participatory' art works

The notion of participatory artworks and interactivity *per se* can too easily be subsumed in hype and idealisation (see the literature review and Lister et al (2003) for a detailed analysis of these points). Claims for neutrality or symmetry in works that invite participation are potentially naïve; it is my contention that a more feasible position is to make as transparent as possible the presence of the author and the power relations at play in any participatory configuration. This is proposed and implemented throughout the *South* project. For reasons of space and containment I have held back somewhat from engaging head-on with the complexities of these debates, however, within the last few months of my doctoral research I have presented a joint paper with Alexandra Anotonopoulou, exploring these issues in relation to this PhD practice and to the *Phi Books* project (a collaborative writing and research project). In this paper we proposed an engagement with the expectations and meaning of participation, asking our audience to gauge the extent to which they felt 'part' of the work we presented. As the next section explains, any further research I undertake in this field will clearly require a continuing engagement with these issues.

Further research

The methodology developed for my PhD practice has now been applied to a range of projects, from generating electronic literature to paper-based story-telling, artist's book production, curation, film making and teaching. Through involvement with the Goldsmiths Research Incubation Transfer program I have developed viable proposals for post-doctoral research and funding. This further research aims to establish a conceptual and pragmatic framework for the development of a computational creative writing mentor and heuristic device. The main focus of this ongoing research is as follows:

- To develop a set of computational and analogue tools to facilitate challenging and lively computational creative writing practices. These tools will support publicly engaged, culturally diverse and inclusive experiences of interactive and analogue writing programs.
- The research will investigate the significant expectations around technology and 'interactive' writing of potential users.
- The investigation will also encourage (and instigate) a productive debate about the future of interactive writing tools, while interrogating the very meaning of the word 'interactive'.

The notion of articulated subjectivity will continue to be investigated as a productive foundation for the users of a computational creative writing mentor and of other projects such as *VAINS*, an online *Visual Art Interpretation and Navigation System* (in collaboration with the curator Lee Weinberg). In keeping with my methodology, situating data and subjective experience will be framed as 'an intellectual resource, rather than a defensive audit'⁶⁹.

In formulating a detailed proposal for further research it is clear that the completion of this PhD has entailed the development of considerable expert knowledge. This knowledge resides both in a material and theoretical engagement with my field, enabling the establishment of appropriate structures and priorities for continuing research. If the PhD process may be characterised as a form of apprenticeship it is

⁶⁹ 192, Payne, Geoff, and Payne, Judy (2005) *Key Concepts in Social Research*, Sage.

my assertion that I have completed this PhD a more capable and informed artist, working with computational and analogue materials with coherent and valid methodologies developed throughout the PhD process and informed by my ongoing practice as a fine artist and writer. The core aims I set out to achieve have also been realised, as recapped below:

- Create dynamic relationships between humans and books.
- Produce a digital and analogue book that tries to understand human subjects, even if that understanding is flawed by the asymmetries of understanding between computers and humans.
- Make the software and book as reflexive, situated and transparent as possible.

The methodology I have generated is physically and culturally situated, temporally sensitive and committed to making visible its embedded values. The *South* software is also environmentally or ecologically 'aware'. This is a workable methodology that has been applied to other forms, including the presentation of papers, creative collaboration, film making and formulating research algorithms in teaching situations with post-graduate and other students. This methodology (and also some of the specific computational methods developed throughout this PhD) is applicable to my further work as an artist, lecturer, programmer and writer, both within and outside the academy. The ideas and practices produced by my research engender many new questions, but they also equip me with significant new tools for generating further new knowledge within the fields of electronic literature, artist's books and human-computer-interaction.

Appendix

Appendix I

'I think it's a grown up culture game, where facts and fantasy determine the game journey.'

(Informant 1, 16/01/10).



Figure 63 Above, evaluation of the *South* software and egg, December 2009 – March 2010.

This appendix contains information and results relating to the evaluation and usability surveys that were undertaken between 2009 and 2010. The appendix also describes other tests that the *South* software was subjected to as well information about obtaining and installing the software. The appendix briefly introduces the three core classes of the *South* system which are fully documented on the *South* website. The site also provides the full code, ready for installation:

http://www.doc.gold.ac.uk/~ma501ed/south/south_Download.html

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Appendix I: The sample and surveys

The sample

The sample for the two core surveys described in this appendix was obtained opportunistically and through referral by other informants. However, I did take measures to balance the sample when it became top-heavy with students, seeking more non-student and non-technically specialised informants, though only two informants described themselves as 'uncomfortable with technology'. Two thirds of

the informants might be described as naïve informants, while the remaining third have a high degree of familiarity with computational technology. One informant, for both surveys, was an expert on interface design.

Interpretation survey and results

The interpretation surveys, as their name implies, invited multiple interpretation of the egg object, both conceptually and physically. The resulting interpretations were diverse and ranged from open hostility to a desire to own and experience the output of such a device. As I have emphasised throughout the body of this thesis (particularly in the Methodology chapter, chapter three), the interpretation and use of these results is not straightforwardly instrumental. However, the diversity of interpretation served as a valuable reminder that the meaning of my work is, in many ways beyond my control. The egg was described at the beginning of the survey, see below.

Figure 58 Below, interpretation survey for the *South* egg

Date_____ Consent to take part, (please sign):_____			
Your answers will not be linked to your name; your name will not be used at any point in this research.			
age	Gender	Occupation	Are you comfortable with technology? (tick beside Y or N below)
			Y: N:
			

Someone gives you an egg shaped object that seems to understand you. When you switch it on and take it to your favourite location, it starts to ask you quite deep questions. It also gives you suggestions for things to do, knowing somehow that you are, for example, shy or overconfident, it asks you to do exercises that give you insight into how you typically react to places and situations and other people.

You follow the exercises, the egg asks you to pretend to be various other people, again knowing how you work psychologically each task is really suited to you. It asks you very personal (but never embarrassing) questions, enquiring about things you might never have asked yourself before.

The egg also asks what you think about events that are happening in the world around you, such as what you feel about the news headlines that day or a famous person who's been involved in a scandal. It asks you to write and draw and smell things and imagine new ways of being you. It never seems to run out of ideas.

Questions for you:

What is it for?

What role could it play in your life?

If you used this egg what do you think it would mean about you?

What would it mean about your social group?

And your society?

Or your culture?

Where would you like to use this egg?

Results of the interpretation surveys

Interpretation Surveys: $n= 21$

Figure 59 following page, tables showing key responses (un-coded) to the egg interpretation survey, October 2009 – December 2009

number	age	gender	occupation	Tech Y	N	Role of egg
1	27	f	student		Y	Link to your conscience/a god (c3)
2	36	f	student		Y	expression assistant,(c15) Self-explanation,(c5) psychiatrist,(c4) shadow, Twin, (c6) friend (c2) mentor(c11)
3	29	f	student		Y	Self-reflection(c5) , 'it would Be "me" when we were just the both of us. (c6)
4	28	f	student		Y	Reducing loneliness(c10), 'the one who will be able to know myself (c5)
5	27	m	student		Y	Annoying machine (c7). Friend(c2) when bored of life.
6	22	m	student		Y	Data collection. (c1) Someone to discuss personal issues with (c8)
7	27	m	artist	N		Therapist (c4)
8	32	f	Student/artist		Y	Mentor,(c11) Clarify role in society. Self-questioning [links to Buddhism] (c3)
9	26	f	Student/private tutor		Y	Friend. (c2) Mentor. Life coach. (c13) Therapist. (c4) Market researcher (c1)
10	43	f	Technical consultant		Y	Company. Fun, entertainment conversation(c8)
11	28	f	student		Y	Thinking machine(c9), a friend (c2)

number	age	gender	occupation	Tech Y	N	Role of egg
12	26	f	student	y		Company? Friend. (c2)Speaks of my fear of being alone(c10), remind me of different activities
13	33	m	Music teacher	y		Understanding self,(c5) environment, media Questioning, communication
14	31	m	lecturer	y		A prompt to view life and events differently. Portal/filter to the stream of information coming in,(c11)
15	32	m	Film/video director	y		A substitute for a pet.(c14) Thought provoking
16	24	f	student	y		Keep you aware of feelings and surroundings, to fully experience every moment— which being surrounded by different people gives you.
17	39	m	Digital media director	y		Friend (c2), a kind of aid, a small representation of part of my mind that is dormant or dulled in time. An alarm that awakens the subconscious
18	35	f	artist	n		I do not understand. This questionnaire makes no sense to me
19	25	m	student	y		Personal surveillance system(c16), friend(c2)
20	14	f	School student	y		Understanding self better (c5)
21	47	f	Systemic psychotherapist	y		Flattering (c17) comfort (c18) affirmation (c19)
22						

Coded results

The responses were reviewed and divided into 'orthogonal' categories, small sets of (ideally) non-overlapping types, which could then be coded. The coding process identified core themes, positive qualities, potential problems, and further questions I needed to answer.

'Orthogonal' categories relating to ideas about what the egg is for:

- Data collection
- friend
- religious
- therapist
- Self-knowledge
- Twin ('another me')
- Annoying machine
- conversation
- Thinking machine
- Counter loneliness
- filter incoming data
- mentor
- Life coach
- pet
- Self-expression
- Don't understand concept

Coded categories

Figure 60 Below, coded categorisations of the *interpretation survey* results:

Category	Category number	Number of responses:
Data collection	C1	2
Friend	C2	6
Religious	C3	1
Therapist	C4	3
Self-knowledge	C5	5
Twin ('another me')	C6	2
Annoying machine	C7	1
Conversation	C8	2
Thinking machine	C9	1
Counter loneliness	C10	2
filter incoming data	C11	2
Mentor	C12	2
Life coach	C13	1
Pet	C14	1
Self-expression	C15	1
Personal Surveillance system	C16	1
Flattering	C17	1
Comfort	C18	1
Affirmation	C19	1

Implications of the results

My understanding of the results and responses to the egg interpretation survey are summarised below, I wrote these responses in early 2010:

- The results reveal potentially problematic areas – that the egg could be perceived as ‘nerdy’, ‘solitary’ or anti-social.
- This is not my intention. I will modify the framing of this work, emphasising its ability to engender social interactions as well as personal reflections.
- The surveys also reveal what I might call some of my own unconscious motivations for this research – certainly to provide companionship and reassurance.
- The survey answers are often poetic, they reveal potential I had not considered for this project – such as aiding people to decode strange environments, and to conduct their own research.
- I have used quotes from these surveys in my methodology chapter, to emphasise the value of consultation, and to emphasise that this is a dynamic, socially engaged project with a high degree of participant design.
- I recognise that I should re-design the ‘interface’ to the system with a much greater degree of participant involvement. User interpretations do offer a richer set of heuristics for me to work with other than just my own. So I want to go back to the most basic aspect of the project and work in detail with potential users. The fundamental programming structures are in place – web scraping, language and image analysis, the gathering and evaluation of situating data from the wider ecology of the program.

Main conclusions

- The project may be perceived as a re-enforcement of self-interest and insularity instead of the dynamic, entangled self-mediation I had envisaged.
- Therefore I need to emphasise my epistemic commitment to a break from notions of self-presence and ‘authenticity’ – in favour of my intended

emphasis on temporal, dynamic and situated agencies and narrative 'becomings'.

- I'll now draw upon potential *users* to re-design an interface that can attempt to accommodate the richness and complexity evidenced by the interpretation survey.

The main result of conducting the interpretation surveys was a confirmation of the need to involve 'readers' or 'users' more closely in redesigning the 'interface' to the *South* software. I then designed a survey script around which I could aim to gain a deeper insight into 'user' engagement with the *South* project. The depth survey (as I have named it) was designed to be completed after informants had gone through every stage of the prototype evaluation software, an engagement which took between 30 minutes and just over an hour and a half. While informants interacted with the software I observed them and documented their responses. The script for that evaluation process is printed in full and discussed below.

Depth survey (usability testing)

Figure 64a Below, *South* usability survey for depth interviews and observation:

***South* software usability testing**

Questionnaire

Participant name:

About this questionnaire:

The purpose of this questionnaire is to help gain an understanding of the people who will use the **South software** and to get any additional feedback or comments about the software.

This information will be used to try to ensure that the *South* software meets the needs of the people who will be using it.

All the information you provide is confidential. Your name is not stored with the results of this questionnaire, and the information you provide will not be used for any other purpose.

About you

1. Age: _____

2. Occupation: _____

Questionnaire

5. Would you describe yourself as comfortable with technology?

About the *South* software:

7. Please indicate the extent to which you agree or disagree with the following statements.

The software is easy to use (ring the word you agree with):

Strongly-Agree agree Neutral disagree don't know

I always know where I am in the software:

Strongly-Agree agree Neutral disagree don't know

It's easy to get lost:

Strongly-Agree agree Neutral disagree don't know

Learning how to use the software is difficult:

Strongly-Agree agree Neutral disagree don't know

I didn't get enough training:

Strongly-Agree agree Neutral disagree don't know

The guidance provided is useful:

Strongly-Agree agree Neutral disagree don't know

8. If there were three things you could change about the software, what would they be?

i)

Many thanks for your help

Eleanor Dare:

Ma501ed@gold.ac.uk

//
/

Results of the depth survey

$n= 4$

A range of very clear and often pragmatic suggestions were generated by the depth survey. These include:

- Highlight the text boxes more clearly
- Provide back buttons in case answers were left out or changed
- Provide error messages
- Have a help button or sound information or pop up windows with help
- Explain the relationship between Ivan's texts and the software more clearly
- Make the modality section easier to understand
- Correct spelling mistakes
- Provide more detailed feedback
- Provide a simple user manual with a quick start guide

In addition to explicit suggestions made by informants my observations generated a number of deductions. I was particularly concerned with assessing how easy users found it to navigate the system, and how legible the instructions were. The following deductions were made as a result of observing readers/users interacting with the *South* software:

- Provision of a 'back' button
- Clearer text boxes
- Fail-safe data entry on every form

- Clearer instructions on the modality form
- Corrected spelling errors
- Changed size of fonts in places where informants had found the text hard to spot.
- Embed mechanisms to prevent the software from being used more than once a day.
- Correct a minor bug that meant two of the modes went back to previous modes after incorrect validation instead of remaining the same until correct input was obtained.

However, upon further observation I decided to remove the 'back' button as it was confusing informants about their navigation of the system, and was also leading to confusion about whether they should use the 'enter' button or the 'back' arrow to change their text entries. Form validation addressed the need to go back through the modes. I would argue that changing answers by going backwards is also against the spirit of the (generally) spontaneous responses solicited by the system.

Figure 65 following page, coded results of the depth survey, separate observation notes were also kept, as evidenced above.

number:	age	occupation	tech: Y/N	1	2	3	4	5	6	i	ii	iii	iv
1	44	Senior technical consultant	Y	SA	N	N	DA	DA	SA	Cursor Back button Error message	Null>>>>		I love it, maybe add some sound or instructions and make it Technophobe proof I think it's a grown up culture game, where facts and fantasy determine the game journey.'
2	46	Civil servant	Y	SA	SA	DA	SA	N	SA	Make Modality section clearer	Clarify Connect- ion to Ivan text And software	Null>>	
3	14	School student	y	SA	N	DS	DS	N	DK	Make answers less vague	There could be more questions about what your favourite picture is or what your opinion of a picture is.	Null>>	
4	46	investigator	N	N	DA	N	N	N	N	a fuller introduction so that you have some idea (doesn't have to be everything before you start	if you make a mistake it should be easier to get back to where you need to be	Null>>	you could have visual line showing where you are in the sequence

Appendix 2

The software

Validation

Validation is the ongoing process of checking software works as it is supposed to work. It also conventionally involves evaluating if the system functions in the way that readers/users want it to. However, as this work has effectively been both commissioned and written by me this is not such a straight-forward process, hence my emphasis upon soliciting multiple interpretations. Validation has been assisted by the concept of 'revisiting' my initial requirements and also of examining software that has some conceptual or pragmatic resemblance to my own. In addition to the works reviewed in chapter two, I have also looked at heuristic (or 'creative') and writing software such as *yWriter5* and *Imagination Engineering* (see bibliography). My analysis

of the structure and methodology represented by these programs has confirmed the assertion that the *South* software offers a significantly alternative interactive and heuristic *creative* system.

Acceptance testing

Acceptance testing, or the testing of the software in a 'live' environment by 'real' users, has been effectively covered by the depth survey described in this appendix. As the depth survey involved no interventions or directions from me about using the software and no time constrictions upon users, it is reasonable to claim that the software has been exposed to acceptance testing, as described by Christian Dawson (2009): 'with real data and performing in real time under normal working pressures' (Dawson, 2009: 138).

Regression testing

Testing the system after I had made non-trivial changes to it encompassed the process of regression testing. This process ensured that I had not introduced any new bugs into the system (as indeed I did do on several occasions). Regression testing is typically applied to group projects where individuals may not understand the workings of code they are not involved in writing, however as the *South* project was developed by me over nearly three years it was equally valid (and necessary) to ensure smooth integration of new code over time with consistent regression testing.

Installability

Though the *South Hacks* section of the *South* book does show readers how to generate a Linux and a Mac version of the software if they wish, the *South* software is currently released for Windows operating systems only (though this may change in the future). Installability on Windows systems has been tested by installing the system on a range of computers at different locations. The system works well, even on relatively older, less powerful, machines. The effect of the tide pushing against

readers is increased on less powerful systems. All systems must have high-speed internet access for the *South* software to function properly.

More detailed information and advice on how to install, use and hack the software is contained in the 'South Hacks' section of the *South* book.

Recovery testing

Recovery testing was undertaken by observing how well the software coped with incorrect or inconsistent data. The *South* system crashed completely and inexplicably on only one occasion during testing. This took place when a range of other programs were running in the background, so it is hard to diagnose a precise cause. The system's ability to cope with 'bad' data (or incorrect entries) has largely been mitigated by validation algorithms embedded throughout the evaluative modules of the software and also throughout the 'web gathering', or data collection software.

Software development methodology

The software development methodology used was incremental. A schema for the high-level program requirements was clearly established before programming started. This enabled the *South* system to be partitioned into three core modules, or intermediate working sub-systems: data gathering, reader evaluation and content generation. Having a partially working software structure, or system *kernel*, at an early stage, allowed me to solicit user/reader involvement before moving on to develop the next module(s), details of the software were modified by means of user involvement but the high-level model was preserved throughout the writing of the *South* programs.

The programming languages I used to write the *South* software were determined by a subjective estimate of how a range of languages might meet my criteria. The criteria specified were: maintainability, technical support, re-usability, supporting libraries and the potential for cross-platform release. This pointed to an object-oriented, cross-platform language. C++ or C (with any sort of GUI) are not cross platform, I therefore chose Java and Processing (with some additional PHP scripts).

In the future I am considering writing a windows release in C++ with a more conventional Windows GUI. However, I am satisfied with the simplicity of the current GUI; its efficacy is confirmed by the usability tests, in which the majority of informants reported that the system was easy to understand and to navigate.

Quick start user manual

What does the *South* software do and who is it for?

The *South* software generates tailor made content for individual readers or users, the content is designed to be used in combination with the *South* book. The book is available to purchase as a hard copy or to download for free in an electronic version at this address: <http://www.lulu.com/content/paperback-book/south-a-psychometric-text-adventure-iv/7337498>

The *South* software is designed to be easily useable by anyone who wishes to interact with it, no special skills are required to install, use or *hack* the software.

To run the software readers should install the free Java plug-in (if they do not already have it) many computers do have this plug-in, but those without can download it here: <http://www.java.com/en/download/index.jsp>

Platform requirements:

The *South* software is currently released for PC only, though users who wish to download the source code (readers who may want to explore hacking their software) can export the software for Linux or Mac operating systems with a minimal amount of effort.

No special memory requirements are necessary to use the software, though readers will need a high-speed (Broadband) internet connection for it to work properly.

Installing and starting the *South* software.

The software is available for free here:

http://www.doc.gold.ac.uk/~ma501ed/south/south_Download.html

There are two versions available: the `quick_start_version` and the `hackable_version`. The `hackable_version` requires readers to also install Processing (the integrated

development environment that will enable them to ‘hack’ into, or re-design the software). The *hackable_version* is also much larger than the *quick_start_version*. Information about installing the *hackable_version* is provided on the *South* download page and in the *South Hacks* section of the *South* book. As its name implies the *quick_start_version* is designed to be quickly and easily installed and used.

Quick start

Download the *quick_start_version* from the *South* download page listed above. Download it to **C:\Program Files** on your computer. Unzip the file and then navigate through the files in this order > *egg_Box* > *Evaluator4* > *web_Gather*. Once inside the *web_Gather* folder click on **web_Gather.exe**. Very soon a grey window will open, after a few seconds you will see CCTV images of the South Bank area on your screen. After a few more seconds this program will close and the next program will automatically open. Be patient, the computer is working hard to gather data for you. The second program that opens is called the *South evaluation software*. It will take you through a series of interesting and fun questions. These will help the system to generate tailor made content for you. The content is confidential and will stay on your system only.

Once you have completed the evaluation software a third window will automatically open, this is the final program. This is the part of the software that generates unique content for you. A series of images will be very rapidly generated. You will know when the software has finished working because it will stop generating images.

You can now access the content that has been generated for you. You will find it in a folder called **your_Content**. It is available at this location on your computer:

C:\Program Files\egg_Box\Evaluator4\larger_egg_Content\your_Content

Transfer the content to your egg (if you have one) or any other image carrying device – a mobile digital picture frame, or mobile phone. Alternatively you could print the images with the *Windows Picture and Fax viewer*. This will print the number of each image, aiding you in reading them in the correct order at the location chosen for you by the software.

When transferring the images it is advisable to select them all and drop them into your device in one go. Once you have transferred the images, destroy (or relocate) the previously generated images so that the 'your_Content' folder is empty for each new session.

Please note: the *South* software will not let you use it more than once a day, this is because the system wants to ensure that unique content is generated for you each time you use it.

Uninstalling the software

Navigate to C:\Program Files\egg_Box. Select the **egg_Box** folder, right click and choose 'delete'. This will remove the *South* software from your system and all records generated by it.

More detailed information and advice on how to hack the software is provided in the 'South Hacks' section of the *South* book.

The core Java classes

Full, commented code as well as Java documentation for the three main programs that constitute the *South* software (*web_Gather.java*, *Evaluator4.java* and *larger_egg_Content.java*) is provided on the *South* site here:

http://www.doc.gold.ac.uk/~ma501ed/south/south_Download.html

Two PHP scripts called by the main programs mentioned above (*tideGather.php* and *sechalf.php*) are also provided at the URL provided above.

web_Gather.java

Upon execution the *South* software invokes 'web_Gather.java'; web_Gather.java retrieves situating data from the web, such as weather data, news headlines, current star signs and CCTV images of London. In tandem with the user-data obtained via

the *Evaluator* program, `web_Gather.java` enables the *South* software to situate itself each time it is run.

Figure 66 Below, excerpt from an algorithm in `web_Gather.java`, it pre-processes, or breaks down and prepares for use data about tide heights at London Bridge.

```
String raw_dat[] = loadStrings("tidesraw.txt");

cleaner_dat = arrayToString2(raw_dat);
//clean away tags to get at data I want:

String ss2 = cleaner_dat.substring(24645, 25470);
// the section
// with all our tide data

String sta = "-- tide chart stats open --";
String en = "tide chart stats close --";
int p1a = cleaner_dat.lastIndexOf(sta);
int p2a = cleaner_dat.indexOf(en);//
String asto = cleaner_dat.substring(p1a, p2a);

String dat = cleaner_dat.substring(p1a, p2a);
outputide l.println(asto);
outputide l.flush();
outputide l.close();

String sta2 = "tidechart";
int p1 = dat.lastIndexOf(sta2);
lastLowH = dat.substring(p1 + 11, p1 + 14); // last low tide
```

Evaluator4.java.

This program takes readers through a range of ‘personality measuring’ processes. The software also asks the reader to react to a range of situating data sources, such as news images and headlines, weather information, CCTV images of the South Bank area and their star sign data for that day.

larger_egg_Content.java

The class *larger_egg_Content.java* (and its three inner classes, *Logic*, *redDetect*, and *histogram_Agent*) generates bespoke content for readers in the form of image files. The amount of content generated is defined by a comparison to my own ‘scores’ or weightings in relation to the system and to the assessment of readers. The colours *larger_egg_Content.java* generates are defined by the height and colour of the Thames at London Bridge, where I was born. The system uses image analysing agents to generate a short narrative about the bus stop outside Borough tube station, and to decide what sort of day or night is unfolding on the South Bank.

Detailed information and advice about how to *hack* all these programs is provided in the ‘*South Hacks*’ section of the *South* book.

Glossary

Agency

Agency influences events and processes and therefore acts within the world. It is important in the context of this thesis to dispense with the notion that agency is a 'thing' or a linear force, or that it is restricted to human agents only.

Agential realism

'Agential realism is a theory of knowledge and reality whose fundamental premise is that reality consists of *phenomena* that are reconstituted in *intra-action* with the interventions of knowers. 'Intra-action' signifies a dynamic involving the inseparability of the objects and agencies of intervention (as opposed to interactions which reinscribe the contested dichotomy). Agential realism accounts for both the contingency and efficacy of knowledge. It provides an understanding of the interactions between human and nonhuman, material and discursive, and natural and cultural factors in the production of knowledge. One of its basic aims is to move considerations of epistemic practices beyond the traditional realism versus social constructionism debates.'

(available at Feminist Encyclopaedia <http://www.bookrags.com/tandf/agential-realism-tf/>, Accessed 01/04/11)

Agents

A human agent makes things happen in the world. A software agent is similarly able (within its own world) to effect changes.

Chat Bots (also called *Chatterbots* and *Chatbots*)

Chat Bots are conversational software agents that engage in conversation, they originate with Joseph Weizenbaum's *Eliza* (1966), though the term *ChatterBot* was

first coined by Michael Mauldin in 1994, when he created the conversational program *Julia*.

Computer Literature (includes Computational Literature and Computational Fiction)

Computer Literature is a term used by Nick Montfort (2003), he uses it in a way that is interchangeable with the term 'electronic literature' and hence encompasses a wide range of forms from hypertext fiction to automatic poetry generators (such as William Chamberlain's and Thomas Etter's *Ractor* (1984)). The word 'literature' is not apparently a qualitative term in the context of digital works.

Cybertexts

A term originated by Espen Aarseth in 1997. Cyber comes from the Greek word *kybernetes* -helmsman, and was used by Norbert Wiener (1948) to describe the concept of *cybernetics*, or control and regulation through feed-back loops of agency and action between machines and people. A cybertext involves similarly distributed agencies. A reader of cybertexts makes decisions which influence the outcome of the text. This does not pre-suppose a digital environment. The ancient *I Ching* also qualifies as a cybertext.

Deliberative

The word deliberative is used in this thesis in connection to the notion of a deliberative agent. A deliberative agent has beliefs, desires and intentions which it can act upon.

Digital Fiction Systems

Used in this thesis to encompass a range of digital-fiction forms and their underlying computation. The term is used in this thesis to include experimental works produced by scientists working in the field of artificial intelligence, and therefore not necessarily works of 'literature' in an orthodox sense.

Digital Literature

Unlike electronic literature, digital literature may also include digitised versions of analogue texts, such as those found on Project Gutenberg (which scans analogue texts and makes them available on the web). The term therefore does not necessarily imply any accommodation of the specific characteristics of computation.

E-books

Electronic books, often in Kindle format (for use on Kindle readers), but also .PDF files. Though they can have links like hypertexts, e-books are often unmodified facsimiles of analogue books. As such they should arguably fall under the term 'digital literature' rather than electronic literature, which is designed to exist within a computational context.

Electronic Literature

The Electronic Literature Organisation (ELO) defines electronic literature very broadly. By the ELO definition⁷⁰ it encompasses chat-bots (conversational software agents), Interactive Fiction (IF) and computer art with literary aspects. All of these varied forms must be 'born' to digitality in order to meet the criteria for electronic literature, meaning that they must be specifically designed for the digital realm as opposed to analogue texts that have been inserted into a digital format with no accommodation for the specific affordances and characteristics of computation.

ELO

The Electronic Literature Organisation. Since 1999 it has promoted electronic literature, see <http://www.eliterature.org/>

Enactivism

In contrast to the mind-body split of the Cartesian *Cogito* as a model for human cognition. An enactivist approach posits "the enactment of a world and a mind on the basis of a history of the variety of actions that a being in the world performs"

⁷⁰ The ELO definition for electronic literature is available here: <http://www.eliterature.org/about> (accessed 30/03/11).

(Varela, Thompson & Rosch, 1991). It is a theory of cognition that is inseparable from action and is therefore implicitly embodied.

Entanglement

The notion of entanglement is central to Karen Barad's (2007) distinction between intra and interaction, and the distinction between objects that are separable, and phenomena, which are inherently more fluid.

Ergodic

Espen Aarseth describes ergodic texts as those in which the reader must work non-trivially to find a path through them; this can include non-digital works such as *the I Ching* and Tarot readings. The word Ergodic comes from the Greek words for work and path.

HCI

Human-Computer-Interaction.

Hypertext

Hypertext is a digital form of text that contains links; it can also contain images and tables. Hypertext can be both factual and fictional. Dynamic hypertext can change continuously. *Hyper* is the Greek word for 'over' or 'beyond', hence the sense that hypertext goes beyond the linearity of analogue text. Hypertext is usually found in the context of the World Wide Web, but it can be viewed and kept locally, on a hard-drive. The term hypertext has no implication for its content; hypertext describes the process of linking texts.

Hypertext Fiction

Hypertext fiction deploys hypertext to create branching narratives. Ready-made hypertext fiction systems (to facilitate the writing of hypertext fictions) include Eastgate Systems and Storyspace. Shelley Jackson's *Patchwork Girl* (1995) is a notable example of a hypertext fiction.

Hypermedia

Hypermedia is described by Ted Nelson (1992) in contrast to 'hypertext:' 'By now the word "hypertext" has become generally accepted for branching and responding text, but the corresponding word "hypermedia", meaning complexes of branching and responding graphics, movies and sound – as well as text – is much less used. Instead they use the strange term "interactive multimedia": this is four syllables longer, and does not express the idea of extending hypertext.' (Nelson, 1992).

Interactivity

In the context of this thesis interactivity refers to the linear relations between computers and humans. This thesis critiques dominant constructions of interactivity as a linear process of inputs and outputs, as opposed to the relational causality of intra-activity outlined by Karen Barad.

Interactive Fiction (IF)

IF (as it is often abbreviated to) describes a type of text-only electronic fiction that uses formal text commands to control events and characters in a story-world. IF systems (to facilitate writing interactive fictions) include Inform, Infocom and TADS. Text Adventures can also be included in this category. A famous example of IF is the *Zork* series by Infocom (1979 onwards).

Intra-activity

According to Karen Barad (2007), intra-action, unlike interaction, does not presuppose 'the prior existence of independent entities of relata' (Barad, 2007:139). Barad does not take for granted atomistic or Cartesian separations between subject and object; instead she sees specific situations and actions as allowing phenomenological relata to emerge as specific causal intra- actions.

Locative Media

Encompasses location based technologies such as GPS, surveillance and wireless technology. It is also a field in which artists use location aware computing devices as both a medium and a philosophical framework for their work.

Mal-adaptation

In evolutionary terms a mal-adaptation (or behaviour that makes survival in a particular environment less likely) is also an inevitable side effect of advantageous adaptation, for example, Dodos became fat to accommodate periods of famine, but this adaptation made them unfit to evade human predators.

Narrative

Toolan (2001) describes narrative as a sequence of non-randomly connected events, but he acknowledges the further difficulty of defining the term 'events'.

Performative/Performativity

Performative understanding is Barad's central challenge to the power we have placed in language as tantamount to reality, as the main agent in systems of representation. Barad's agential realism specifically acknowledges and takes account of 'matter's dynamism' (Barad, 2007:135). This approach is an opportunity to move away from the infinite regress of epistemological self-reflection and representation, to forms of knowing and knowledge generation that are rooted in practices, events and real-world action.

Situated/Situatedness

In the context of artificial intelligence situated agents are embedded in an environment. In Donna Haraway's terms (1988) situatedness is also an ethical recognition of the partiality and locatedness of knowledge, as opposed to an idealised notion of objective universality, neutrality and non-partiality.

Real World Interaction (RWI)

As technology becomes increasingly mobile and therefore not confined to the desktop, old paradigms such as WIMP (window, icon, menu, pointing device) become less suitable. RWI are interactions and systems designed for dynamic real-world

environments. These interactions may recognise a user's voice and location while also responding to embodied actions such as gesture and facial expression.

Subjectivity

Subjectivity implies personal and individual thoughts, attitudes and perceptions. A common definition will characterise subjectivity as emanating from an individual rather than the external world, highlighting the ontological separations at play in the notion of the subjective, particularly those of the self and other, the individual and society, but also of mind and body.

Text Adventures/Text Games

See Interactive Fiction. Classic examples of Text Adventures include *Adventure* (Will Crowther, 1975), later re-modelled as *Colossal Cave Adventure*, and *Adventureland* (Scott Adams, 1978).

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